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ENTRIES 6132–6737

BOTANICAL ABSTRACTS

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IMPORTANT NOTICE

INDEX TO VOLUME 12

The December (concluding) number of Volume 12 will be devoted to the author and subject indexes for the volume. This volume, therefore, should not be bound until the number, which will be considerably delayed, is received. Meanwhile publication of Volume 13 (1924) will proceed. The cost of the index number of Volume 12 is included in the subscription price for that volume.

INDEX TO VOLUME 11

This index (concluding number of Volume 11, 1922) is in preparation and will be distributed at the earliest possible time. Its cost is included in the subscription price for the volume.

CUMULATED INDEX TO VOLUMES 1 TO 10

Cumulated subject and author indexes of Botanical Abstracts, volumes 1 to 10, are ready to print. The author index contains about 26,000 citations while the subject index has 60,000 entries with perhaps 3 or 4 times as many citations. All topics mentioned in the abstracts are suitably indexed. For a sample page, see cover page 4 of this issue. The completed work will comprise a volume of about 500 pages.

Subscribers are reminded that the early volumes were sold on the basis of a book of 300–325 pages. It was planned, at the outset, to publish annual subject indexes; but when a variety of circumstances made this impossible the volumes were filled up with abstracts and author indexes. Upon examination it will be found that the first 10 volumes average 311.4 pages each.

Subscribers have already received notices regarding subscriptions to the index; attention is again called to the fact that in order to secure the special pre-publication price of $10.00 (cloth-bound copies, if available, $11.00) orders must be in the hands of the Business Manager on or before December 15. The post-publication price will be $12.00 for paper-bound copies (cloth-bound copies, if available, $13.00). Non-subscribers who desire a copy of the notice are requested to communicate at once with the Business Manager.

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BOTANICAL ABSTRACTS

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Vol. 12 NOVEMBER, 1923 No. 9

ENTRIES 6132-6737

AGRONOMY

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(See also in this issue Entries 6242, 6357, 6465, 6527, 6585, 6594, 6638, 6639, 6645)

6132. Anonymous. **Number of seeds per unit weight.** Seed World 11^2: 22. 1922—A standard table is presented indicating the number of seed per unit weight for certain kinds of field seeds; it has been adopted by the Association of Official Seed Analysts of North America.—*M. T. Munn.*

6133. Anonymous. **State seed testing methods in Denmark.** Seed World 10^4: 23–24. 1921.—A report is presented on the history and work of the Danish State seed testing station. Laboratory methods used in making purity and germination tests are described.—*M. T. Munn.*

6134. Anonymous. **Vitality of Lespedeza seed limited.** Seed World 11^3: 44. 1922.—Well-matured seed give a high percentage of germination when fresh, but the germination decreases rapidly when the seed are kept over. Only a few seed live over the 3rd year.—*M. T. Munn.*

6135. Anonymous. **Wimmera rye grass: What it is and where it should be used.** Seed World 12^3: 24. 1922.—Wimmera rye grass (*Lolium subulatum*) is a drought-resistant form of the biennial Italian rye grass. Like Italian rye grass, the Wimmera variety is an annual and the seed is somewhat similar in form, although minus the awns.—*M. T. Munn.*

6136. Barrow, E. H. **Cane varieties at Guanica.** Facts about Sugar 15: 500. 1922.—Desirable and undesirable qualities of the most important varieties are recounted.—*C. W. Edgerton.*

6137. Bjerg-Jensen, J. C. **A new variety of Danish white clover.** Seed World 11^7: 19. 1922.—The new variety is the Mors white clover.—*M. T. Munn.*

6138. B[rooks], C. F. **The critical period of wheat at College Park, Md.** [Rev. of: Sando, W. J. **The critical period of wheat at College Park, Md.** Monthly Weather Rev. 49: 301. 1921.] Bull. Amer. Meteorol. Soc. 2: 84. 1921.—"In eastern Maryland it was found that high yields of wheat occurred in the drier years and vice versa, especially when the rainfall for the 35–50 days before harvest was small."—*Earl S. Johnston.*

6139. Brown, E. **Labeling of field seeds by seedsmen.** Proc. Assoc. Official Seed Analysts North America **1919**: 27–28. 1921.—In 1919, after an understanding whereby the seed trade voluntarily agreed to label all farm crop seeds with certain information, purchases made indicated that only 10 per cent of the lots of seed so purchased by the U. S. Department of Agriculture for this purpose were fully labeled. Later purchases disclosed an even smaller proportion of the lots fully labeled. It is concluded that any reform must be secured through other means than voluntary agreement.—*M. T. Munn.*

6140. Busse. **Tagesfragen aus dem deutschen und ausländischen Tabakbau. [Present day questions regarding German and foreign tobacco culture.]** Mitteil. Deutsch. Landw. Ges. **38**: 241–244. 1923.—In this address before the Colonial Section of the German Agricultural Society the speaker called attention to the possibilities of expanding tobacco culture in Germany. Special mention is made of the introduction of American varieties. The work of Garner and Allard is referred to as helpful in selecting varieties that will succeed under German conditions.—*A. J. Pieters.*

6141. Chamberlain, James F. **Relationship between weather and crops.** Bull. Amer. Meteorol. Soc. **2**: 67–68. 1921.—The probable frequency of early and late frosts has been studied and although weather cannot be controlled, agriculturists and shippers can carry on their work by following weather forcasts in such a manner that crop losses may be reduced to a minimum.—*Earl S. Johnston.*

6142. Claus, G. **Grundlagen und Aufgaben einer modernen deutschen Saatzuchtwirtschaft. [Foundations and tasks of a modern German seed breeding establishment.]** Mitteil. Deutsch. Landw. Ges. **38**: 293–298. 1923.—In this address before the seed breeding section of the German Agricultural Society the speaker outlined the weather and soil requirements for successful seed culture; the organization and physical plant, including machinery; the technical demands and especially the point of view made possible by recent advances in knowledge of heredity.—*A. J. Pieters.*

6143. Colon, E. D., and A. M. de Andino. **Cane varieties in northern Porto Rico.** Facts about Sugar **16**: 32–33. 1923.—The several varieties grown are discussed.—*C. W. Edgerton.*

6144. Cunningham, Byrsson. **Indian irrigation.** [Rev. of: **Triennial review of irrigation in India, 1918–1921.** *v + 222 p.* Government Printing Office: Calcutta, 1922.] Nature **111**: 388–389. 1923.—In 1919–20, there were under irrigation in India 28 million acres, with 55,202 miles of Government channel in operation.—*O. A. Stevens.*

6145. Dahlberg, R. C. **The identity of certain sweet clover seed.** Proc. Assoc. Official Seed Analysts North America **1919**: 25. 1921.—Some of the seed of yellow sweet clover (*Melilotus officinalis*) are sufficiently similar to those of white sweet clover (*M. alba*) to make complete separation of the 2 species impossible. There are, however, seed of yellow sweet clover which are spotted with small splotches of purple of unequal size and degree of color. Seeds so marked can definitely be assigned to *M. officinalis.*—*M. T. Munn.*

6146. Dorph-Petersen, K. **Meddelelse om forskellige Undersøgelser ved Stratsfrøkontrollen i København. [Communication on investigations at the state seed testing station in Cophenhagen.]** Nordisk Jordbrugsforskning **1922**: 429–441. *2 fig.* 1922.—The speed of germination is important since a small difference in this respect between 2 samples will be reflected in a considerably lower percentage of germination, both in the laboratory and in the field. Shelled seed of timothy (*Phleum pratense*) have generally only $\frac{3}{5}$–$\frac{3}{4}$ of the germinating value of seed with glumes, and lose their germinating power much more rapidly. The shelled seed of cocksfoot grass (*Dactylis glomerata*), oats, and tall oat-grass (*Arrhenatherum elatius*) are also inferior, although not to such an extent as in timothy.—*Ernst Gram.*

6147. Dymond, J. R. **Colour characteristics of red clover seed.** Proc. Assoc. Official Seed Analysts North America **1920**: 30–32. 1921.—The author's results indicate that in red clover seed harvested in Ontario in 1916 the purple colored seed were slightly more prevalent and in practically every case weighed more per thousand seed than the yellow. Germination tests made 32 months after harvest show that the yellow seed give a higher percentage of germination and contain more hard seed than the purple. The green or immature seed give the lowest percentage of germination but contain a surprisingly high proportion of hard or impermeable seed. The brown seed are shown to be low in vitality and to contain the smallest percentage of hard seed.—*M. T. Munn.*

6148. Easterby, H. T. **Bureau of Sugar Experiment Stations.** From: **Annual report of the director. II.** Australian Sugar Jour. **15**: 43–46. 1923.—At the Mackey Experiment Station subsoiling in comparison with the customary cultivation using Green Goru (N. G. 24 B) as the cane crop showed that subsoiling increased the crop. The tabular results are given of trials made with varieties of imported cane to test their commercial values. The dates for arrowing of different varieties of cane growing at the Mackey Station are given in a table.—*C. Rumbold.*

6149. Eggington, Geo. **Irrigation water as a factor in the dissemination of weed seeds.** Proc. Assoc. Official Seed Analysts North America **1919**: 20–21. 1921. [See Bot. Absts. 8, Entry 1594.]

6150. Evans, E. E. **"Canada Peas" grown 100 B. C.** Seed World 9^4: 30. 1921.—Many varieties of peas that are called "Canadian" have been grown in Manchuria for more than 2,000 years and in the U. S. A. since the time of the Pilgrims.—*M. T. Munn.*

6151. French, G. T. **The effect of commercial blue blotting paper on the germination of timothy seed.** Proc. Assoc. Official Seed Analysts North America **1920**: 55–56. 1921.—Tests reported indicate that the commercial grade of blotting paper is not reliable for germinating timothy and redtop seeds. The behavior of seed on such paper cannot be depended upon to show their state of vigor. Seeds of timothy and redtop show sprouts but no roots upon such paper. Only paper should be used which has been found reliable by comparative tests with paper known to to be free from these toxic substances. A chemical analysis of the paper does not appear to be a reliable guide.—*M. T. Munn.*

6152. Froberville, L. F. de. **Degeneration of Uba cane.** South African Sugar Jour. **7**: 303–305. 1923.—There can be no degeneration of Uba cane in Africa since the cane is always propagated by cuttings, not by seed. Poor cane can be accounted for by lack of cultivation and plant food. Seed-cane should be carefully selected or canes may be imported from other regions in Africa. Manure and lime should be used, and trash should not be burned before harvesting. Legumes should be cultivated in cane fields, and crops rotated.—*C. Rumbold.*

6153. Fuente, Carlos Casado de la. **Ueber günstige Wirkung von Gips auf Keimlinge der landwirtschaftlichen Kulturpflanzen. [On the favorable effect of gypsum on seedlings of agricultural plants.]** Illus. Landw. Zeitg. **42**: 340. 1922.—This report of pot experiments shows increased growth of maize and lucerne due to the use of gypsum. It is concluded that acid soils should, if practicable, first be treated with calcium carbonate or with quick-lime to neutralize acids. Gypsum should then be used for promoting the development of the young plants.—*John W. Roberts.*

6154. Garman, H. **Germination of scarified hard seeds.** Seed World 12^8: 15; 12^9: 19. 1922.—The author describes a laboratory scarifier constructed for use on hard seeds of legumes. A table shows a gain of 11.2 per cent in total germination as a result of scarifying 10 minutes in this car with its boxes lined with sandpaper, and 15.8 per cent from treating 20 minutes. —*M. T. Munn.*

6155. Garman, H. **Kentucky blue grass seed crop.** Seed World 13[6]: 20–21; 13[8]: 18–19. 1923.—In this discussion of the Kentucky blue grass industry the 1st article deals principally with seed production and the 2nd mainly with purity and germination testing methods.—*M. T. Munn.*

6156. Garman, H. **The effect of paradichlorobenzene on the vitality of stored seeds.** Seed World 11[4]: 19–20. 1922.—Tests made imply that seed can be protected by paradichlorobenzene where they are kept rather closely confined, and loss of viability, if any, is slow and very slight. This fumigant stops injury in seed already infested with insects. It was not determined whether the fumigant would leave odor or flavor on seed to be used for food.—*M. T. Munn.*

6157. Gerlach. **Beiträge zur Kenntnis der Wirkung einer Phosphorsäuredüngung. [Contribution to a knowledge of the effect of fertilizing with phosphoric acid.]** Mitteil. Deutsch. Landw. Ges. 38: 259–264. 1923.—The author reviews the arguments of those who advocate a reduced use of phosphoric acid. On a farm on which 26 kgm. phosphoric acid in excess of that removed by crops had been applied per hectare each year from 1870 to 1912, the application in 1922 of superphosphate and Thomas meal resulted in marked increases in the yield of potatoes. The results of phosphoric acid fertilizer tests on potatoes, barley, winter-wheat, and meadows, carried on by a large number of coöperators, are given in tabular form.—*A. J. Pieters.*

6158. Gerlach. **Die Gewinnung von Eiweiss im Inlande. [Domestic production of protein.]** Mitteil. Deutsch. Landw. Ges. 38: 352–355. 1923.—Attention is called to the great decrease in protein-rich feeds and human food in Germany. A decrease is shown in the yield per unit area and in the areas planted, and the following remedial measures are suggested: (1) increase in area cultivated; (2) fertilizing grain-bearing legumes, clovers, meadows, and pastures with nitrogen; (3) better methods of conservation, especially for protein-rich green fodder plants; (4) feeding urea. There is a general discussion under each head. In regard to urea it appears that experiments have not been uniformly favorable and that the high cost makes its use at this time questionable.—*A. J. Pieters.*

6159. Gloyer, W. O. **Sclerema and hardshell, two types of hardness of the bean.** Proc. Assoc. Official Seed Analysts North America 1920: 60. 1921.—The 2 distinct types are: hardness of the interior, to which the name sclerema is given; and hardening of the seed coat, which is termed hardshell. The former results from enzymatic changes produced by storing the seed in damp atmosphere and at a high temperature in the absence of ventilation. The latter is a physical condition produced by storing seed in an artificially heated room with a low relative humidity. Beans ripened in hot, dry weather also acquire this condition in the field. The seasonal variation of the germination of the red kidney and lima beans is due to changes in the impermeability of the seed coat. Mature as well as immature beans develop the hardshell condition, which may be corrected by plunging the seed for 5 seconds in boiling water followed by immersion in cold water, or by exposing the seed to flowing steam.—*M. T. Munn.*

6160. Henke, L. A. **Cane varities in Hawaii.** Facts about Sugar 15: 320–321. 1922.—The history and characteristics of the principal sugar cane varieties grown in Hawaii are treated.—*C. W. Edgerton.*

6161. Hillman, F. H., and Helen H. Henry. **The identification of seed of Italian alfalfa and red clover.** Proc. Assoc. Official Seed Analysts North America 1919: 24–25. 1921. [See also Bot. Absts. 5, Entry 27.]

6162. Hopkins, C. G., J. E. Whitchurch, H. F. T. Fahrnkopf, and F. H. Kelley. **Yields from ten wheat fields in "Egypt."** Illinois Agric. Exp. Sta. Circ. 236. *1 p.* 1919.—The results are given of soil fertility tests on wheat, *Triticum sativum*, grown on 10 experimental fields in the southern part of Illinois.—*O. H. Sears.*

6163. Hopkins, Elizabeth F., and M. T. Munn. **Variations in seed tests—application of the tolerance formula.** Proc. Assoc. Official Seed Analysts North America 1920: 62-63. 1920. Also, Seed World 9[1]: 23-24. 1921.

6164. Hornaday, W. D. **Results of paper covering of cane.** Sugar 24: 249-250. 1922.—Covering cane fields with a specially made paper conserves moisture, prevents packing of the soil, reduces labor, and considerably increases the yield.—*C. W. Edgerton.*

6165. Hughes, H. D. **Comparative germination of seeds sampled by hand and by the pneumatic seed counter.** Proc. Assoc. Official Seed Analysts North America 1919: 13-14. 1921.—Data are presented to show that the mechanical seed counter or sampler is a time saver, the personal element is eliminated, and that this method of taking samples of 100 seed for germination testing is accurate.—*M. T. Munn.*

6166. Jones, J. M., and R. E. Dickson. **Grain sorghums versus corn for fattening lambs.** Texas Agric. Exp. Sta. Bull. 306. *32 p.* 1923.—All west Texas grows more or less of the grain sorghums, while corn is often a failure because of lack of rain. The experiment shows that ground threshed Milo and Kafir produce practically the same gains as ground shelled corn when fed to lambs in the same amounts. There is little difference in the value of milo and kafir. As the sorghums are cheaper than the corn, the cost is 10–17½ per cent less than corn. The Kansas Experiment Station has carried out similar tests which substantiate the results in this report.—*L. Pace.*

6167. Jones, Jennie Sales. **Two methods of testing hairy vetch seed for purity.** Proc. Assoc. Official Seed Analysts North America 1920: 60-62. 1921.—Two methods, designated as the Count and the Weight methods were used in an attempt to determine which would give the smaller number of variations. The author is inclined to use the weight method for the present.—*M. T. Munn.*

6168. Kennedy, P. B. **Observations on some rice weeds in California.** California Agric. Exp. Sta. Bull. 356. *467-494.* 1923.—Flooding in summer to germinate the seeds and then plowing under the young seedlings is one of the most effective methods of cleaning foul rice lands. Repeating the flooding and then disking should also be very effective. Controlling water grass by the submergence method is gaining many adherents. Water grass does not come up through 8 inches of water, whereas rice will. Controlling water grass by rotating rice with some other crop, especially a legume, would be an ideal method but as yet the drainage or soil conditions required to grow other crops successfully have not yet been realized. On some of the better lands, not typical rice lands, grain or sorghum will produce good crops in a rotation. Hand weeding is effective but expensive. The use of clean seed rice is an effective method of control. A list of 34 rice weeds, and a discussion of the nature of their growth is given.—*A. R. C. Haas.*

6169. Klautke, P. **Nutzpflanzen und Nutztiere Chinas.** [Economic plants and economic animals of China.] *159 p., illus.* Weltwirtschaftliche Abhandlungen, edited by S. Berliner. Band 5. Hanover, 1922.—Plant geography is discussed in the introduction; and in the various chapters the following are discussed. Field crops: grains, sorghum, millet, wheat, barley, rye, oats, maize, rice. Oil seeds: sesame, beans, rape, peanuts. Fiber plants: cotton, China grass, hemp, jute, flax, Abutilon hemp or Sida hemp. Vegetables: potatoes, sweet potatoes, yams, eggplants, turnips, kohlrabi, taro, cabbage, cucumbers and melons, onions, lotus. Orchard crops: orange, peach, apricot, plum, cherry, pear, apple, medlar, persimmon, lichi, pineapple, berries, grapes, walnuts. Imporant plant products: tea, opium, sugar, tobacco, varnish, green vegetable tallow, cassia, gallnut, rhubarb, ginger, indigo, shellac, camphor, fiber lace, matting, Ningpo hats, palm-leaf fans, anise, bamboo. Animal industry, the silk industry from cultivated and wild silk, white (insect) wax, and Chinese flower gardens are also covered. There is a general review of the fauna of China, and a bibliography.—*W. B. Lydenberg.*

6170. Kramer. **Die Zuckerrübenstandweitenversuche des Jahres 1922. [The sugar beet-spacing investigations in 1922.]** Mitteil. Deutsch. Landw. Ges. 38: 179–180. 1922.—The drills were spaced 40, 50 and 60 cm. Out of 42 tests, the 40-cm. spacing gave the highest yield in 40.5 per cent of the cases, the 50-cm. spacing in 52.4 per cent, and the 60-cm. spacing in 7.1 per cent. The sugar production per hectare was found highest in 50 per cent of the cases for 40-cm. spacing, in 47.5 per cent for 50-cm., and in 2.5 per cent for 60-cm. spacing.—*A. J. Pieters.*

6171. Kron, Oskar. **Zum Düngungsversuche mit heissvergorenem Stallmist. Manuring experiments with hot-fermented stable manure.]** Mitteil. Deutsch. Landw. Ges. 38: 380–384. 1923.—On field A potatoes were grown in 1921 and wheat in 1922; on field B potatoes were grown in 1922. The results are given in detail in 2 tables and confirm the report previously made that hot-fermented stable manure and green manure produce higher yields than does yard manure.—*A. J. Pieters.*

6172. Leonhards. **Neuerscheinungen auf dem Düngemittelmarkt. [Recent appearances in the fertilizer market.]** Mitteil. Deutsch. Landw. Ges. 38: 398-400. 1923.—The author refers by trade name to a number of new fertilizers and gives results of tests or of analyses. Most of these preparations were found to be without value; a few have not been sufficiently tested to warrant a positive statement but their value seems doubtful. Many of the preparations mentioned were of the humus type designed to increase the bacterial life of the soils, such as Biohumus.—*A. J. Pieters.*

6173. Löbbecke, von. **Ist es bei der Missernte an guter Leinsaat möglich und ratsam die Ansaat stärker herabzusetzen? [Is it possible and advisable, in case of a poor harvest of flax seed, to sow greatly reduced amounts?]** Mitteil. Deutsch. Landw. Ges. 38: 143-144. 1923.—The writer's personal experience was that good results could be had with seeding 30 pounds per morgen provided the seed was drilled in carefully prepared land.—*A. J. Pieters.*

6174. Lunz, H. **Shall impermeable seeds be counted as part of the germination test.** Proc. Assoc. Official Seed Analysts North America 1920: 67–70. 1920. Also, Seed World 9[1]: 21–22. 1921.

6175. McConnie, R. C. **Cane cultivation at Fajardo.** Facts about Sugar 15: 440–441. 1922.—Methods of cultivation are discussed, including liming, plowing, ditching, planting, fertilizing, and harvesting.—*C. W. Edgerton.*

6176. Meyer, D. **Düngungsversuche mit Stickstoff zu Schmetterlingsblütlern. [Fertilizer experiments with nitrogen on legumes.]** Mitteil. Deutsch. Landw. Ges. 38: 180–182. 1923.—The trials with red clover showed a slight increase in yields, but no increase in protein content. Those with luzerne showed a fair increase in yield for the 1st cutting but not for the 2nd and a very slight increase in the protein content. The trials with lupines showed no increases whatever.—*A. J. Pieters.*

6177. Milligan, S. **Review of sugar cane agricultural operations in India, 1921-1922. From: Annual review of agricultural operations in India issued by the agricultural adviser to the government of India. Pusa** [January, 1923]. Internat. Sugar Jour. 25: 242–246. *1 map.* 1923.—An account is given of the successful trials on a field scale of the seedling sugar canes bred at the Sugar Cane Station at Coimbatore. Co 205, Co 210, Co 213, Co 214, and some others are very promising. Some of their characteristics are described.—*C. Rumbold.*

6178. Munn, M. T. **The nature and cause of the "water sprout" encountered in germination testing.** Proc. Assoc. Official Seed Analysts North America 1920: 54. 1921.—The so-called "water sprout" which may be found on germinating seeds of many kinds, especially prevalent and conspicuous on the legumes, is not a normal growth process but occurs on dead

or greatly weakened seeds. The exciting causes of the "water sprout" in many cases appear to be bacteria and fungi of one or more species which have been stimulated to activity by placing infested seed under conditions of moisture and heat in the process of germination.—*M. T. Munn.*

6179. Naik, Kasanji D. **Report of the Secretary, Sugar Bureau (India).** Sci. Rept. Agric. Res. Inst. Pusa 1921–22: 88–96. 1922.—The Bureau has propagated and tested promising varieties of Java, Coimbatore (South India), and local sugar cane in North Bihar. Statistical information and advice about machinery and mills have been supplied to manufacturers.—*Winfield Dudgeon.*

6180. Nicholson, G. **Field experiments with wheat, Wagga experiment farm.** Agric. Gaz. New South Wales 34: 322–325. 1923.—There were 17 wheat varieties under trial grown on fallow for grain. Wandilla yielded highest at 32 bushels per acre. Three of these varieties and 2 others were under trial for hay production.—*L. R. Waldron.*

6181. Nolte, O. **Die Düngung landwirtschaftlicher Kulturpflanzen mit Schwefel. [Fertilizing agricultural plants with sulphur.]** Mitteil. Deutsch. Landw. Ges. 38: 248–249. 1923.—Pot or field tests were made at 7 stations using lucerne, orchard grass, rye grass, red clover, white clover, and potatoes as indicator crops. Various soil types were used. No notable increases were found with lucerne or potatoes. In the 1 test reported red and white clover showed some, and orchard grass and rye grass, slight increases. Details are given in tables and in 1 case analyses are given of the crops variously fertilized.—*A. J. Pieters.*

6182. Page, R. L. **Uba cane in Porto Rico.** Facts about Sugar 15: 420–421. 1922.—Uba cane was introduced into Porto Rico on account of its resistance to the mosaic disease. It is also a very heavy yielding cane and will probably become firmly established in spite of its small size and high cost of harvesting.—*C. W. Edgerton.*

6183. Pieters, A. J. **Red clover seed consumption in the United States.** Seed World 13[4]: 13–14. 1923.—On the basis of the wheat acreage for 1921–22 and data regarding the percentage of wheat acreage seeded to clover, the author estimates the total annual consumption of clover seed in the U. S. A. at 120–130 million pounds, of which 85–92 million pounds is red clover seed.—*A. J. Pieters.*

6184. Roemer, Th. **Anbau und Züchtung der Lupine.** [Culture and breeding of lupines.] Mitteil. Deutsch. Landw. Ges. 38: 168–169. 1923.—The writer calls attention to some difficulties attending culture and breeding of lupines.—*A. J. Pieters.*

6185. Saunders, C. B. **Fifth annual report, Official Seed Testing Station for England and Wales.** Jour. Nation. Inst. Agric. Bot. 1: 24–35. 1922.—A steady growth over the work done in previous years was made. Now a part of the National Institute of Agricultural Botany, the Station has commodious and well equipped quarters and the advantage of close contact with the plant breeding work of the Institute.—Tables show the number of tests made of the different kinds of seed, the average results of the tests and the source from which the samples were received. Approximately 10 samples were received from seedsmen for each sample received from farmers. At the beginning of the year the method of testing grass seed was changed from the so-called Irish method to the Continental method. A short course in seed testing was given during the summer.—*E. Brown.*

6186. Scheumann, Georg. **Die Gewinnung von Eiweiss für Futterzwecke und die menschliche Ernährung nach dem Pohlschen Verfahren. [Securing albumin for feed and for human consumption by the method of Pohl.]** Mitteil. Deutsch. Landw. Ges. 38: 271–292. 1923.—The speaker called attention to the method patented by Pohl according to which lupine seed is extracted with a salt solution from which the albumin is then precipitated by

appropriate reagents. The product is a whitish yellow powder containing 98–99 per cent pure albumin. Bread made from ¾ rye or wheat flour plus ¼ lupine meal tastes like good rye bread and has a much higher protein content. This lupine albumin can also be used in many technical industries as in cotton manufacture and in the preparation of photographic plates, films, etc. The ground and extracted lupine seed still contain a large amount of protein and can be mixed with molasses to make a high grade cake. Analysis of the extracted residue is given.—*A. J. Pieters.*

6187. Schneider, Karl. **Die Bewirtschaftung der Wiesen und Weiden unter Berücksichtigung der wirtschaftlichen Seite in Bezug auf Viehhaltung und Viehzucht. [The management of meadows and pastures considered economically with respect to cattle keeping and cattle breeding.]** Mitteil. Deutsch. Landw. Ges. 38: 254–258. 1923.—In this address emphasis is laid on drainage and the use of fertilizers.—*A. J. Pieters.*

6188. Shepard, Cola W. **Dry land agriculture in northeastern Wyoming.** Bull. Amer. Meteorol. Soc. 2: 125–128. 1921.—A plea is made to solve the problem of obtaining water for agricultural purposes in the Great Plains region, thereby increasing its productivity many fold. The author believes the rainfall, if none were lost, is sufficient to produce crops. The paramount need is a method for conserving soil moisture and, to some extent, controlling evaporation.—*Earl S. Johnston.*

6189. Shepard, Cola W. **The grasses of the plains.** Bull. Amer. Meteorol. Soc. 2: 130–132. 1921.—The author disagrees with Redway in believing that the soil rather than the climate determines whether the vegetation in the Great Plains region be bunch grass or sod.—*Earl S. Johnston.*

6190. Sifton, H. B. **Longevity of the seeds of cereals, clovers, and timothy.** Proc. Assoc. Official Seed Analysts North America 1919: 22–24. 1921.—Seeds of spring wheat, oats, timothy, alsike and red cover, stored in cotton sacks or manila envelopes in galvanized iron chests, were used. Tests were made with an alternation of temperature from 20 degrees to 30 degrees C. Practically all the kernels of spring wheat retain their vitality for the first 5 years. Then the weaker ones begin to die and more than 75 per cent of the seed lose their vitality between the ages of 11 and 15 years, about ½ of these dying in their 13th year. The longevity of oat seed was found to be much greater than that of wheat, 40 per cent of the 19-year-old kernels being alive. Timothy seed begins to depreciate in value at once. The germination percentage began to fall rapidly after the 7th year, when it was 84 per cent. By the 12th year it was 11 per cent, and after 17 years the seed was practically all dead. Both alsike and red clover have a larger proportion than wheat of seed that lives over 15 years, but from the standpoint of a practical seedsman their longevity is not nearly so great. After 11 years, wheat on the average still germinated more than 85 per cent, but 11-year-old alsike and red clover germinated less than 40 per cent.—*M. T. Munn.*

6191. Sörensen, S. **Grass seed industry in Denmark.** Seed World 13[1]: 20–21. 1923.—Seed activities in Denmark are described.—*M. T. Munn.*

6192. Sörensen, S. **Root seed industry in Denmark.** Seed World 13[3]: 18-19. 1923. [See preceding entry.]

6193. Spieckermann, A. **Wie kann die weitere Verbreitung des Kartoffelkrebses in Deutschland verhindert werden? [How can the further spread of potato wart in Germany be checked?]** Mitteil. Deutsch. Landw. Ges. 38: 175–179. 1923.—Within recent years this disease has appeared in commercial potato farms, in addition to its earlier distribution in small gardens, and energetic measures are needed to prevent its further spread, since new channels of distribution are thereby opened up. Furthermore, it is much more difficult to enforce quarantine regulations where extensive farming communities are involved. The

writer doubts the practicability of the police regulation of planting and disposal of the crop, which it is proposed to put into effect in Prussia. Other means must be employed to encourage the use of immune varieties, and the lack of an immune, late, white-fleshed, starch potato must be met by breeding. The ultimate limits of infestation must be determined, since experiment has shown that the disease may be carried in about 10 per cent of outwardly sound potatoes grown in infested soil.—*F. Weiss.*

6194. Stevens, O. A., and H. D. Long. **Some modifications of the vertical air-blast separator.** Proc. Assoc. Official Seed Analysts North America **1919**: 18–19. 1921.—A shelf is substituted for the stand supporting the glass receiving cylinder. The cylinder terminates below in a funnel, the chaff being thereby deposited directly into a container. The regular $1\frac{1}{4}$ inch glass blowing tube has been replaced by a tube of slightly larger diameter and 6 inches longer for certain of the larger sized seeds.—*M. T. Munn.*

6195. Veve, Rafael A. **Our experience with cane varieties.** Facts about Sugar **15**: 482–483. 1922.—Conclusions are drawn from 11 years' tests with different cane varieties at the Fajardo Experimental Station, Porto Rico.—*C. W. Edgerton.*

6196. Waldron, C. H. **Notes on germination of Kentucky bluegrass.** Proc. Assoc. Official Seed Analysts North America **1919**: 14–15. 1921.—Duplicate samples of Kentucky bluegrass seed germinated in germination chambers with controlled temperature and in daylight with ordinary temperature showed a higher germination in daylight than did duplicates in the dark chamber. The room tests gave an average increase of 21 per cent over the chamber tests. The daylight tests gave the samples of low viability a much greater increase over their dark chamber duplicates than it did to the samples of ordinary viability. It is suggested that direct sunlight has a controlling effect on fungi which was not operative in the dark chamber tests.—*M. T. Munn.*

6197. Webber, H. J. **The place of plant breeding in commercial seed companies.** Seed World **10**[4]: 15. 1921. [See also Bot. Absts. 10, Entry 139.]

6198. Whitcomb, W. O. **Correlating laboratory tests of seed germination with field tests.** Proc. Assoc. Official Seed Analysts North America **1920**: 51–54. 1921.—Many samples of different kinds of seed were selected, tested in the regular way in the laboratory, and duplicates planted in the field in rows of 100 seed each. The statistical method is employed in analyzing the data, which show certain relationships between laboratory and field tests in the germination of seed. Preliminary tests show a somewhat higher percentage of germination in the laboratory tests.—*M. T. Munn.*

6199. Wiancko, A. T. **Italian clover seed is not adapted to Indiana soils.** Seed World **9**[11]: 23. 1921.—In an experimental comparison of imported Italian red clover seed with native seed the Italian died out during the winter while the strips seeded with native seed showed no winter-killing whatever.—*M. T. Munn.*

6200. Wieringa, G. **"Daylight" germination best method for some varieties of seed.** Seed World **13**[12]: 31. 1923.—The author reports detailed research with grass, vegetable, flower, and tree seeds germinated in diffuse light and in direct sunlight. Of the grasses, orchard grass, redtop, timothy, meadow foxtail, Kentucky bluegrass, and rough stalked meadow grass germinated best in diffuse light. Canada bluegrass should be germinated in direct sunlight. Of the garden seeds, chicory, parsnip, and parsley gave the same results whether germinated in the dark or in the light. Celery, endive, and tomatoes gave decidedly better results in sunlight. A table shows the temperatures and days on which counts should be made when seeds are germinated in the dark. Methods for making 2 types of sunlight chambers are given.—*M. T. Munn.*

6201. Wilson, A. C. **Tolerance limits of weed seeds.** Proc. Assoc. Official Seed Analysts North America 1919: 26–27. 1921.—The author presents a table showing the number of seed per gm. and ounce for some 18 kinds of field-crop seeds. The table also shows the number of noxious weed seeds which taken collectively would render the seed unsalable for seeding purposes when a seed law requires that the prevalence of weed seeds be determined by proportion or ratio.—*M. T. Munn.*

6202. Yoder, P. A. **Sugar cane culture for syrup.** Facts about sugar **15**: 12–13, 37, 114–115, 158, 176–177, 222–223, 260–261, 302–303, 322, 328, 333, 341, 343, 380–381, 402–403, 405, 462–463, 518–520. 1922.—The author discusses cane varieties, cane soils, the cultural practices best adapted to syrup production, and cane insects and diseases.—*C. W. Edgerton.*

BIBLIOGRAPHY, BIOGRAPHY, AND HISTORY

Carroll W. Dodge, *Editor*
Charles A. Weatherby, *Assistant Editor*

(See also in this issue Entries 6150, 6169, 6247, 6256, 6265, 6296, 6311, 6316, 6388, 6497, 6498, 6564, 6608, 6646, 6647, 6694)

6203. Benecke, Wilhelm. **Moritz Büsgen.** Ber. Deutsch. Bot. Ges. **39**: (87)–(96). 1921/1922.—Büsgen was born July 24, 1858, at Weilburg am Lahn and died July 22, 1921, at Hannöversch-Münden, where for 20 years he was professor of botany at a school of forestry. He had studied the ecology of insect-catching plants and of acid-soil plants, but his chief efforts were in the general subject of forestry. His principal work is The Structure and Life of Forest Trees. A list of his publications is given.—*C. A. Weatherby.*

6204. Boresch, Karl. **Friedrich Czapek.** Ber. Deutsch. Bot. Ges. **39**: (97)–(114). *Portrait.* 1921/1922.—Czapek, professor of botany at the German University in Prague, was born in that city May 16, 1868, and died July 31, 1921, from the after effects of disease contracted while serving as surgeon at a camp of prisoners of war in Bosnia in 1916. His principal studies were in physiological botany; his chief work is The Biochemistry of Plants. A list of 94 publications is given.—*C. A. Weatherby.*

6205. Calkins, Gary N. **The debt of science to Pasteur.** Sci. Monthly **17**: 1–16. 1923.

6206. Harms, H. **August Schulz.** Ber. Deutsch. Bot. Ges. **39**: (115)–(127). 1921/1922.—Schulz, professor at Halle, was born at Stettin Dec. 8, 1862 and died Feb. 7, 1922. His life was an almost continuous struggle with various physical infirmities; nevertheless, he accomplished much, principally in floristics and phytogeography. His Outlines of the Development of Central Europe Since the Tertiary Period and similar works are noteworthy. A list of his 128 publications is given.—*C. A. Weatherby.*

6207. Howe, James M., Jr. **George Rogers Hall, lover of plants.** Jour. Arnold Arboretum **4**: 91–98. 1923.—This is a short biography of Hall, who first sent Japanese plants direct to the U. S. A. and introduced such plants as *Malus Halliana Parkmanii*, *Abies homolepis*, *Magnolia stellata*, *Abies homolepis*, *Thujopsis dolobrata*, and *Lilium auratum*, now highly valued as ornamental plants.—*Alfred Rehder.*

6208. Huard, V.-H. **L'abbé Provancher.** Nat. Canadien **48**: 160–165, 181–188, 193–194, 198–203, 231–236, 254–260, 280–287, 1922; **49**: 45–48, 64–67, 89–92, 105–110, 136–139, 162–168, 186–189, 208–211, 230–234, 258–264. 1923.—This is a continuation of a biographical sketch of the great Quebec naturalist who was the founder of Le Naturaliste Canadien.—*A. H. Mackay.*

6209. Lesourd, F. **Quelques moyens de publicité des anciens horticulteurs. [Some means of advertising of old horticulturists.]** Rev. Hort. **94**: 84–85. 1922.

6210. Lo Priore, G. **Odoardo Beccari.** Ber. Deutsch. Bot. Ges. 39: (56)–(87). *Portrait.* 1921/1922.—Beccari died at Florence Oct. 20, 1920, aged 77. He is best known for his work, systematic and ecological, on the Malesian flora, and especially on the taxonomy and phylogeny of the Palmaceae. He was also an active and ardent naturalist in other fields, such as zoölogy, and "one of the principal founders of the vitalistic theory." A list of his numerous publications is given.—*C. A. Weatherby.*

6211. Lucas, W. P. **Pasteur and the science of medicine.** Sci. Monthly 17: 29–34. 1923.

6212. Richter, Oswald. **Karl Mikosch.** Ber. Deutsch. Bot. Ges. 39 (31)–(55). *Portrait,* 1921/1922.—This includes a sketch of the life of Mikosch (1852–1919), professor at Brünn. Austria; and a detailed account of his work on physiology and anatomy of plants. A list of 20 publications is appended.—*C. A. Weatherby.*

6213. Rosengarten, F. **Cinchona and the quinine industry.** Pharm. Era 56: 537–538, 542. *3 fig.* 1922.—An account is presented of the early use of Cinchona bark, the discovery and manufacture of quinine, and the introduction of Cinchona culture into the East Indies.—*C. M. Sterling.*

6214. Smith, C. N. **A brief history of the seed trade associations in America.** Seed World 13[7]: 19. 1923.

6215. Ultée, A. J. **In memoriam Dr. K. Gorter†.** Bull. Jard. Bot. Buitenzorg III, 4: 247–259. *Portrait.* 1922.—The paper deals chiefly with the scientific researches of Gorter and contains a list of his publications.—*Alfred Rehder.*

BOTANICAL EDUCATION

C. Stuart Gager, *Editor*
Arthur H. Graves, *Assistant Editor*

(See also in this issue Entries 6320, 6650, 6654, 6734, 6736)

6216. Dalley, R. P. **A visit to the Forest Research Institute, Dehra Dun. Pt. 1.** Indian Forester 49: 227–248. *Pl. 9–10.* 1923.

6217. Gager, C. Stuart. **Twelfth annual report of the Brooklyn Botanic Garden, 1922.** Brooklyn Bot. Gard. Rec. 12: 25–103. 1923.—Brief summaries are given of investigations at the Brooklyn Botanic Garden during 1922 in plant pathology, forest pathology, exploration, ecology, genetics, and systematic botany; also an account of the educational activities of the Garden. The report of the director is followed by reports of heads of departments and financial statements.—*C. S. Gager.*

6218. Garden Club of America. **Pronunciation of plant names.** *14.5 × 8 cm. 94 p.* National Process Co., Inc.: New York, 1922.

6219. Kirkwood, Esther J. G. **Plant and flower forms: Studies of typical forms of plants and plant organs.** *4 to, xvi, + 80 p.* Sidgwick and Jackson, Ltd.: London, 1923.—The underlying idea has been to assist the pupils to observe the typical forms of plants and plant organs, by comparing these drawings side by side with the living specimens; and so to inspire them to make a similar set of drawings for themselves. The clear line drawings are grouped to illustrate the following subjects: natural orders, pollination, fruits and seed dispersal, germination, vegetative reproduction, trees, special morphology (spines and cladodes), climbing plants. Two pages are occupied with a summary of botanical terms.—*C. S. Gager.*

6220. Patel, R. D. **First steps in evolution.** *120 p.* R. D. Patel: Nanpura, India, 1921.

6221. Raber, Oran. **Botanical facilities in Paris.** Sci. Monthly **17**: 35–42. 1923.—The facilities for research at the following institutions are outlined: the Normal School, Pasteur Institute, Museum of the Botanical Garden, and the University of Paris. In the last place there are 2 departments where botany is taught,—at the School of Pharmacy and the College of Science.—*L. Pace.*

6222. Thone, Frank E. A. **Trees and flowers of Yellowstone National Park.** *70 p., 112 fig.* J. E. Haynes: Saint Paul, 1923.

6223. Torrey, R. E. **Introductory botany.** *78 p.* Massachusetts Agric. Coll.: Amherst, 1922.—This is a textbook written in a condensed style for the use of beginning students in botany at the Massachusetts Agricultural College. It deals wholly with the seed plants with regard to adaptation to environment from an evolutionary standpoint. Successive chapters consider: the seed plant and its organs; the seed and its germination; the root; the stem; the leaf; flower and inflorescence, fruit and seed; history of botany and principles of classification; general ecology.—*R. E. Torrey.*

6224. Torrey, R. E. **The anatomy and physiology of the seed plants.** *viii + 85 p.* Massachusetts Agric. Coll.: Amherst, 1922.—This companion text [see preceding entry] is for use in a second course in botany. Successive chapters deal with: structure of the cell; activities of the cell; anatomy of the vegetative system; coal and its formation; physiology of the vegetative system; reproduction of seed plants and elementary genetical principles; introduction to the lower forms of plant life. This text, as well as the one mentioned in the preceding entry, is not intended for high school use, but for college classes taught by trained botanists who will expand and clarify by means of charts, lantern slides, and discussions.—*R. E. Torrey.*

6225. Went, F. A. F. C. **Leerboek der algemeene plantkunde. [Textbook of general botany.]** *xi + 599 p., 253 fig.* J. B. Wolters: Groningen and the Hague, 1923.—The book is confined to morphology and physiology. It is intended for students who have had only preparatory courses in physics and chemistry, and is planned to cover 2 years' work in college. The physiological section includes the subjects of asexual and sexual reproduction, with several sections on genetics. Systematic botany is excluded.—*C. S. Gager.*

6226. Wettstein, Richard. **Handbuch der systematischen Botanik. [Handbook of systematic botany.]** Vol. I. *3rd rev. ed., viii + 467 p., 1915 fig., 3 diagr.* Franz Deuticke: Leipzig and Vienna, 1923.—The ground plan of the first 2 editions has not been essentially altered, but the details have been brought into harmony with the investigations of the 10 years preceding 1921-22. The range of subjects has been extended, and the illustrations have been increased. The book is to appear in 2 volumes, the 1st volume ending with II Abteilung. Anthophyta, I. Unterabteilung. Gymnospermae. 6. Klasse. Gnetinae.—In the general part the new headings are (1) the evolution theory as the basis of systematic botany, and (2) the significance of alternation of generations for the phylogenetic development of the plant kindgom.—In the special part the new headings are: under class Fungi A, Phycomycetes, Ascomycetes, Basidiomycetes; B, Ascolichenes, Basidiolichenes. Under VII. Stamm. Cormophyta: classification of the Cormophyta, classification of the Pteridophyta, and under the latter heading a new class, Psilophytinae.—*C. S. Gager.*

CYTOLOGY

Gilbert M. Smith, *Editor*

(See also in this issue Entries 6316, 6474, 6482, 6487, 6615)

6227. Crüger, Otto. **Untersuchungen über Mesekret und Autoplastensekret. [Secretions by mesophyll cells and chloroplasts.]** Ber. Deutsch. Bot. Ges. 39: 175–178. 1921.—The author examined 393 species for the presence of oil-drop secretions in the leaves. In all cases where drop secretions were observed in the mesophyll cells there was intensive secretion by the chromatophores. He thinks, therefore, that the drops in the mesophyll cells really arise from chloroplast secretions.—All species of the gymnosperms examined (28) and all of the Labiateae examined (26) contained oil-drop secretions in the mesophyll cells. Palmaceae (15), Polygonaceae (9), and Cactaceae (7) had no secretion drops in the leaves of any of the species examined. In all other species examined the presence of oil-drop secretions in the leaves seemed to be correlated with thickness of the cuticle. If the mean thickness was less than 0.5 μ oil drop secretion was never observed, but if the mean thickness was over 5.0 μ secretion drops were always present.—Mesophyll secretions arose in leaves of *Camellia japonica* in the light even in a CO_2-free atmosphere, but there were no drop secretions in the darkened leaves.—*S. H. Eckerson.*

6228. Guilliermond, A. **Les constituants morphologiques du cytoplasme. [The morphological constituents of cytoplasm.]** Bull. Biol. France et Belgique 54: 465–512. *Fig. 1–24.* 1921.—Problems in cytology can not be understood until vegetable and animal cytology are combined. In 10 years' study various organs of the frog, man, and many forms of plant life (including Ascomycetes, Algae, monocotyledons, and dicotyledons) were examined, resulting in the following conclusion: Cytoplasm seems to have a homogeneous appearance, containing in suspension certain elements among which are to be distinguished (1) a chondriome, of which a part in chlorophyll is affected by photosynthesis; (2) a vacuolar apparatus, very much reduced in animal cells; (3) fat granules. Chondriome is a constant element of cytoplasm, in both animal and vegetable cells, and seems to be wanting only in very primitive forms in which a typical nucleus is not developed. The vacuolar apparatus is equally constant, at least for vegetable cells. Fat granules are very frequent in vegetable cells, but it is not yet certain that they are generally present in cytoplasm.—*A. Chase.*

6229. Guilliermond, A. **Nouvelles observations cytologiques sur les Saprolégniacées. [New cytological observations on the Saprolegniaceae.]** La Cellule 32: 429–454. *Pl. 3.* 1922.—In *Achlya* and *Leptomites* the cytoplasmic inclusions and the evolution of the vacuolar system are essentially the same as in *Saprolegnia*, described in 1920. The following inclusions may be distinguished by the use of intra-vitam stains: (1) granular and rod-shaped chondriosomes; (2) lipoid droplets, formed by the union of many smaller ones arising as a metabolic product in the cytoplasm (the smaller ones are what Dangeard calls microsomes); (3) granules of a glycogen-like substance, possibly precipitated out by the reagents; (4) vacuoles, containing a substance which has the characters of metachromatin in *Leptomites* but not in *Achyla*, and which may be precipitated out as granules by the stains. Other granules of unknown composition also occur in the vacuoles.—In young hyphae the vacuolar system is made up of numerous fine, partially anastomosed filaments. As the hyphae age, these swell and unite to form the large axial vacuolar canal. The vacuolar system in a new apical segment of a hypha is not formed de novo, but as an extension of the system in the segment below. In hyphae forming zoosporangia the vacuoles fragment and become very minute and numerous. The zoospores contain such concentrated vacuoles, together with chondriosomes, lipoid droplets, and granules of the glycogen-like material. At germination the small vacuoles fuse to form larger ones which develop into the vacuolar system of the new plant.—The vacuolar system, like the chondriome, is a constantly present element of the cell. Vacuoles cannot be regarded as differentiated organities of the cytoplasm (tonoplasts of DeVries; hydroleucites of Van Tieghem) incapable of arising except by division, but appear

rather to represent a system of colloidal substances which are non-miscible with cytoplasm, and which absorb water and swell, or lose water and contract or fragment, according to physical conditions. The system grows by the constant secretion of the substances composing it, and thus has a continuity; it is possible that vacuoles arise de novo, but this was not observed. It is probable that the reticular apparatus of Golgi and the canaliculi of Holmgren represent 2 aspects of 1 system which corresponds to the vacuolar system of the plant cell (Guilliermond and Mangenot). [See also Bot. Absts. 8, Entry 1832.]—*L. W. Sharp.*

6230. Linsbauer, K. **Über die kalkfreien Cystolithen der Acanthaceen. [Calcium-free cystoliths of Acanthaceae.]** Ber. Deutsch. Bot. Ges. 39: 41–49. Illus. 1921.—Molisch [Österreich. Bot. Zeitschr. No. 11, 1882] early described the cystoliths of certain Acanthaceae (*Strobilanthes glomeratus, S. isophyllus, Ruellia ochroleuca*), and gave calcium-free cystoliths as characteristic for the internodes while the nodes had the usual calcium carbonate-incrusted form.—The author finds that the pith cells of young internodes of *Strobilanthes isophyllus* have typical calcium carbonate cystoliths; later the calcium carbonate dissolves and the cystoliths change to the peculiar forms which Molisch saw. The cystoliths of the cells at the nodes still retain their calcium but nodes of stems several years old have calcium-free cystoliths. Thus the calcium-free cystoliths of the Acanthaceae are calcium carbonate cystoliths which have undergone decalcification and subsequent change of form.—With the disappearance of calcium the cellulose skeleton becomes less dense, the protuberances are lost, the body shrinks in the radial direction and sinks against a lateral wall. Lignification of the original cellulose begins within, the outer hull changes to pectin. Secondary cellulose stalks attach the body to the lateral wall. As the adjacent cells divide, the calcium-free cystolith extends the length of 4 or 5 cells and appears much like a schlerenchyma fiber. The striking changes in form are shown in text-figures.—*S. H. Eckerson.*

6231. Pizek, Artur. **Chromosomenverhältnisse, Reductionsteilung und Revision der Keimenentwickelung der Mistel (Viscum album). [Chromosome conditions, reduction, division, and embryonic development of the mistletoe.]** Jahrb. Wiss. Bot. 62: 1–19. 1923.—The author undertakes to clear up the question of whether the reproduction in the mistletoe takes place normally or parthenogenetically. The somatic divisions show the presence of 20 large chromosomes. The pollen and embryo sac mother cells undergo a typical reduction of the chromosome number, the process being somewhat different in the 2. Normal fertilization takes place, and the embryo develops, after a resting period of a few weeks. The development of the mistletoe is, therefore, not apogamous, and, in the absence of insect pollination, must be aenomophilous.—*S. F. Cook.*

6232. Showalter, Amos M. **The chromosomes of Riccardia pinguis.** Amer. Jour. Bot. 10: 170–172. *1 pl.* 1923.—In this species the haploid number of chromosomes is 10. Occasionally a small, spherical body staining like a chomrosome is found among the chromosomes but is probably not chromosomal in nature or origin. The chromosomes differ somewhat in size, but only 1, the smallest, is distinguishable with much certainty. The sporophytic chromosomes have the same general appearance as those of the thallus. There is no perceptible difference between the chromosomes of the male and those of the female plants.—*E. W. Sinnott.*

6233. Whiting, P. W. **Further points of the relation of cytology and genetics.** Jour. Heredity 14: 116–118. 1923.—Shull has recently discovered crossing over in *Oenothera* while Gates, on the basis of study of the late prophases before heterotypic division, holds that conditions are not consistent with the chromosome theory of crossing over. Wenrich from cytological studies of very early stages in first spermatocytes of the grasshopper, *Phrynotettix*, shows parasynapsis of single leptotene strands. In temperature experiments with *Drosophila*, Plough shows that crossing over must take place at a very early stage in this form. Bridges shows genetically that crossing over must take place in the 4-strand stage. On the basis of his own cytological studies on *Culex*, Robertson's report on splits in anaphase chromosomes of the last spermatogonial division in grasshoppers, and Taylor's demonstration of the tetrad

nature of the 1st maturation chromosomes in plants (*Gasteria*), the author concludes that leptotene strands are really double, and hence the zygotene quadruple. There is thus the possibility of crossing over in quadruple strands at a stage much earlier than that which Gates has adequately studied.—*P. W. Whiting.*

ECOLOGY AND PLANT GEOGRAPHY

George D. Fuller, *Editor*

(See also in this issue Entries 6141, 6169, 6188, 6189, 6259, 6354, 6426, 6475, 6491, 6495, 6527, 6554, 6559, 6560, 6575, 6637, 6638, 6646, 6656, 6678, 6683, 6684, 6702, 6707, 6724, 6725)

GENERAL, CONDITIONS, MEASUREMENTS

6234. Baumann. **Wissenschaftliche Gesichtspunkte für die Beurteilung von Sorten und Sortenversuchen mit besonderer Berücksichtigung der Anbaugebiete.** [Scientific points of view for judging varieties and variety tests with special reference to culture regions.] Mitteil. Deutsch. Landw. Ges. 38: 309–313. 1923.—This is a discussion of the ecological relations of plants and a plea for a more exact study of their reactions to different factors of the environment.—*A. J. Pieters.*

6235. B[rooks], C. F. **Bioclimatic zones determined by meteorological data.** [Rev. of: Hopkins, A. D. Bioclimatic zones determined by meteorological data. Monthly Weather Rev. 49: 299–300. 1921 (see Bot. Absts. 12, Entry 6238).] Bull. Amer. Meteorol. Soc. 2: 83. 1921.—It is possible to establish the position of life zones with meteorological data.—*Earl S. Johnston.*

6236. B[rooks], C. F. [Abstract of: Shreve, Forrest. **Vertical gradients of evaporation and soil moisture in desert and coastal mountains.** Paper presented at the joint meeting of Amer. Meteorol. Soc. and Assoc. Amer. Geographers, Dec. 30, 1920.] Bull. Amer. Meteorol. Soc. 2: 42–43. 1921.—The rainfall-evaporation ratio at the tops and bases of desert and coastal mountains was studied. Conditions best for plant growth were found at the summits of desert mountains and at the bases of coastal mountains.—*Earl S. Johnston.*

6237. Gonggrijp, J. W. **Verslag over een studiereis door een gedeelte van Venezuela.** [Report of an expedition through a part of Venezuela.] Dept. Landb. Suriname Bull. 43. *64 p.* 1921.—Venezuela possesses soil and climate of great diversity. In Venezuelan Guiana forests extend over 45,000,000 hectares. The continuation of the llanos areas appears as savannas. Delta Amacuro is low and flat, rising gradually in the south to the Imataca Mountains that form the limits of the forests. The climate of Delta Amacuro differs little from that of Suriname but is moister than that of Bolivar. Little is known of the climate of Amazonas. The region of the llanos has almost no forests but the coastal region of the Andes is partly forested. The chief forest products are rubber, balata, pendare, tonka beans, copaiva balsam and the bark of the mangrove.—The Botaname forests are apparently the driest and those near the Yuruan moister, especially those against the slopes of the Imataca Mountains. The exploration and exploitation of the forests are carefully guarded by law under which yearly permits are granted for taking lumber and other products. No cutting is allowed within 100 m. of water and provisions are made for the replacement of cut forests. The collection of gums, resins and fruits is regulated so as to prevent cutting. The maximum annual cut allowed on a concession is 1250 hectares.—*J. C. Th. Uphof.*

6238. Hopkins, Andrew D. **Bioclimatic zones determined by meteorological data.** Monthly Weather Rev. 49: 299–300. 1921.—The preliminary stages of a system of similar or equal zones of life and climate are presented. The major zones are the familiar frigid, temperate, and tropical, which however do not follow the parallels of latitude even at sea level. Each of the major zones is divided into from 4 to 7 minor zones. The index or characterization elements of the minor zones are many, but the most essential is the "thermal mean principle"

consisting of a table of sea level thermal constants. The thermal principle is based on the theory that (1) the temperature below that favorable for life activities during the coldest month contributes to the poleward limit of the species which characterizes a warmer zone; (2) the temperature above that favorable for the beginning of life activities during the hottest month contributes to the equatorial limit of the species which characterize a colder zone.—Bioclimatic zones thus determined are thought to be more significant than those of other systems. [See also Bot. Absts. 12, Entry 6235.]—*Geo. D. Fuller.*

6239. **Пачоскій, І. К.** [Pachoski, J. K.] **Основы фитосоціологіи.** [Principles of phytosociology.] *iv + 346 p.* Изданіе студенческаго Комитета Сельско-Хозяйственнаго Техникума [Edition of Student's Committee of Agricultural Practice, Cherson]: 1921.—The introduction is devoted to the problems and methods of study of phytosociology. The existing and possible relationships between this and other branches of botanical studies are examined and illustrated. In the body of the volume the following are among the principal subjects discussed: ecological data; biological types and growth forms (biomorphs); the forms, structure, dynamics, types and composition of plant communities; sociological types; analogies of plant societies; dynamics and stages in the development and retrogression of plant cover; types of plant formations, plant societies, herbaceous plant societies, and forest societies; the distribution of vegetation and the history of plant cover. There are also brief contributions to the study of the vegetation of former geological ages, to the extent of vegetation areas and of floras, to the phylogenetic development of vegetation, and to a consideration of plant societies and culture.—*V. Lashevsky.*

6240. **Reed, W. W. Climatological data for Central America.** Monthly Weather Rev. **51:** 133–141. 1923.

6241. **Reiche, Karl. Die Vegetationsverhältnisse in der Umbebung der Hauptstadt von Mexiko. [The vegetation in the vicinity of the Capitol City, Mexico.]** Bot. Jahrb. Beiblatt. 129: 1–115. *27 fig.* 1922–23.—The subject matter is treated under three parts: Part I. Physical geography and climatology. Part II. Plant geography in the State of Mexico. Part III. The floral catalogue. Under the first part the following headings are found: (1) Orography and hydrography; (2) Climatology. The 2nd part is divided into: A. The plant formations; I. Of forests and steppes; 1. The forests in Desierto de Los Leones; 2. The Canada of Contreres; 3. Mount Ajusco; 4. The vegetation of Cerro San Miguel and of the upper part of Canada; 5. The vegetation of the volcano Xitle; 6. The vegetation of the Sierra de las Cruces; 7. The vegetation of the Barranca de Cuajimalpa; 8. Smaller forests; 9. The formation of jungles and thickets as remains of earlier forests; 10. Mount Ixtapalapa; 11. Mount Santa Catarina and its neighbors; 12. The Xochitepec (flower mountain); 13. The Tentli; 14. Mount Chimalhuecan; 15. The Cerro del Pino and its neighbor Texotote; 16. Mount Texcotzingo; 17. The Sierra de Guadaloupe; 18. Mount Calacoaya; 19. The Pedregale (lava fields); 20. The vegetation of the rolling and flat lands. II. The formations of the alluvium; 1. Vegetation of more or less saline soils or waters; 2. Vegetation of the non-saline soils or waters. III. The formation of weeds and cultivated plants. IV. Fossil plants. V. Tabular view of the previously described formations. B. Local peculiarities of the flora of the regions concerned; the relation of this flora to the neighboring states and to America as a whole, endemism. C. Ecological peculiarities of some plants of the region; 1. Biology of vegetative organs; 2. Biology of the reproductive organs; 3. Lianes and climbing plants, epiphytes, parasites; 4. Water plants; 5. Periodicity in the vegetation; 6. Notable damage to the vegetation caused by fungi. Under Part III a list of the species is given following comments on the flora and some statistics. A total of 1488 spermatophytes occur in the region. The list includes also the lower plants.—*K. M. Wiegand.*

6242. **Smith, J. Warren. Agricultural meteorology.** Bull. Amer. Meteorol. Soc. **1:** 19–20, 63–66. 1920.—Topics for work and discussion in relation to agricultural meteorology are suggested.—*Earl S. Johnston.*

STRUCTURE, BEHAVIOR, SYMBIOSIS

6243. Anonymous. [Rev. of: Ashby, Edwin. **Sensitive labellum in orchids.** Minutes of a meeting of the Linnaean Society on May 4th, (1922).] Jour. Indian Bot. 3: 116. 1922.

6244. Bachmann, E. **Untersuchungen über den Wasserhaushalt einiger Felsenflechten. [Investigations on the moisture relations of some rock lichens.]** Jahrb. Wiss. Bot. 62: 20–64. 1923.—The author has studied the conditions governing the relative amount of water absorbed and given off by several species of foliose and crustose lichens, including the following: *Umbilicaria pustulata, Gyrophora vellea, G. cirrosa, G. polyphylla, G. hirsuta, G. cylindrica, Lecidea bullata, L. athroocarpa, L. speira, Rhizocarpon geographicum, R. obscuratum, Pannaria pezizoides, Lecothecium nigrum, Diploschistes bryophilus* and *D. scruposus*. The author finds that the foliose species are much superior to the crustose forms in their ability to absorb rain water. However, the crustose forms absorb more running water, per gm. dry weight, than the foliose, and also lose water more rapidly when subjected to dry conditions, with the exception that under the direct rays of the sun the condition is reversed. *Gyrophora vellea* and *G. cylindrica* excel the other forms in absorbing water vapor. The same crustose lichen behaves differently toward water depending on the type of rock substratum. The less compact the rock the more developed is the thallus and consequently the greater is the ability to take up water. In contrast to those lichens possessing special organs of absorption are some which are destitute of these but which still flourish. The author concludes that the plasma of these types can endure more adverse conditions and can carry on the processes of life with less water.—*S. F. Cook.*

6245. Funke, G. L. **Recherches biologiques sur des plantes à tiges rampantes. [Biological research on plants with creeping stems.]** Compt. Rend. Acad. Sci. Paris 176: 604–606. 1923.—Differences in the humidity of the air immediately about the plants have been held as a possible explanation of differences in the structure of erect and creeping stems of the same species. In a set of experiments plants were grown in dry and moist conditions, the humidity differing by 40°–50° throughout the entire period. The plants in the more humid atmosphere had better developed parenchyma with cells of about the same size, they had fewer but larger vessels, more feebly developed sclerenchyma, a smaller vascular cylinder in proportion to the diameter of the stem, and much thinner leaves. These differences are similar to those of creeping and erect stems. Two species of *Potentilla* and 1 each of *Fragaria, Hieracium, Lysimachia,* and *Glechoma* were studied.—*C. H. Farr.*

6246. Naveau, R. **Enkele veranderingen door aanpassing bij Sphagna. [Some changes by adaption in Sphagna.]** Natuurw. Tijdschr. 4: 166-170. 1922.—Systematic investigations of several Sphagnum forms show that the various facies are dependent upon light and water. A plant growing in direct light usually has no green leaves, and shade plants are green. Much light and little water retard the formation of chlorophyll, change the green to yellow or red, and give a low compact plant; but with little light and much water the plant remains green and has a loose appearance. *Sphagnum crassicladum* v. *plumosum* behaves like a true aquatic, the hyaline cells keep their protoplasm and maintain the same activities as the green cells. When water diminishes the plumosum form of several *Sphagnum* species changes. The quantity of water in a Sphagnetum depends partly upon the quantity of light. In little light and little water Sphagna are very compact, forming cushions. Incurved, wavy and projecting leaves belong to the relatively dry group, incurved stiff leaves to the aquatic group. Different conditions of illumination and water supply produce forms of *S. crassicladum* Wtf. that have been recognized as different varieties. The same thing seems to occur in *S. magnifolium*. The development of red pigment is also promoted by decreased water supply and greater illumination.—*J. C. Th. Uphof.*

6247. Ramsbottom, J. **Orchid mycorrhiza.** Trans. British Mycol. Soc. 8: 28-61. *Pl. 2–7.* 1922.—This paper is essentially a critical review of the literature on mycorrhizas with special reference to the cultivation of orchids and the physiological relations between the seed

plants and the mycorrhizal fungi. It is pointed out that in families in which endotrophic mycorrhizas are typically developed the seeds are small and ill-adapted for successful germination but are produced very abundantly thus increasing the probability that some of them will meet with exceptionally favorable conditions for germination, these conditions usually including the presence of the endophytic fungus.—*W. B. McDougall.*

6248. Rayner, M. Cheveley. **Mycorrhiza in the Ericaceae.** Trans. British Mycol. Soc. 8: 61–66. 1923.—The recent work of Christoph which is at variance with that of Rayner is criticized as inaccurate and lacking in proof at various stages. It is reiterated that under experimental conditions the development of the Calluna seedling is bound up with infection by the endophytic fungus and that such infection takes place regularly from the testa of the seed at, or subsequent to, germination.—*W. B. McDougall.*

6249. Rimbach, A. **Die Jahresperiode der Pflanzen bei Montevideo.** [Seasonal periodicity of the plants at Montevideo.] Bot. Jahrb. 58: 182–189. 1923.—Six tables of native, introduced, and cultivated plants are given showing the duration of foliage and the blooming season of herbaceous and woody species and the period of shoot-elongation and fruiting of the latter. Some herbaceous plants bear leaves in summer, others in winter. The leafless period of woody plants is winter or after the spring. Herbaceous and woody plants bloom in all months of the year but the shoots of woody plants occur in the spring.—*K. M. Wiegand.*

VEGETATION

6250. Campbell, Douglas H. **Australasian botanical notes. II. Victoria, South Australia, and West Australia.** Amer. Jour. Bot. 10: 173–186. *2 pl.* 1923.—An account is given of the characteristic vegetation of these states, with notes on some of the more conspicuous and important species. The history of the peculiar flora of Western Australia is discussed.—*E. W. Sinnott.*

FLORISTICS

6251. Gleason, Henry Allan. **Evolution and geographical distribution of the genus Vernonia in North America.** Amer. Jour. Bot. 10: 187–202. *3 fig.* 1923.—The section *Lepidaploa* of this genus includes 120 species in North America. Of this there are 2 sub-sections, each well developed in continental South America and extending northward. In one of these the inflorescence is a leafy-bracted scorpioid cyme and in the other the bracteal leaves are suppressed. Minor species groups are based on differences in achenes, involucre, pappus, and pubescence. Characters presumably primitive in one group may indicate advanced evolution in another, and such characters have no apparent correlation with environment. The center of evolution and migration for these plants is presumably South America. In all cases those groups which are morphologically the most primitive occur farthest south and the more complex ones appear progressively farther north, and this situation is true for most of the individual species, as well. All the evidence indicates that progressive evolution and northward migration have proceeded together.—*E. W. Sinnott.*

6252. Пачоский, И. К. [Pachoski, J. K.] **По пескам Днепровского уезда. (Ботанические экскурсии.)** [Sandy country of Dnieper district. (Botanical excursions.)] *146 p.* [Cherson, 1919.]—Here are given the results of a phytogeographical study of the sandy regions of the Dnieper district (Cherson province). The origin of the elements of the flora is discussed and a synoptical list of the species is given.—*V. Lashevsky.*

6253. Ridley, H. N. **The distribution of plants.** Ann. Botany 37: 1–30. 1923.—Changes in the distribution of plants are discussed comprehensively with numerous examples chosen chiefly from the Malay region. The chief factors dealt with are changes in climate and in land surface and human agencies. Under the latter head are discussions of the destruction of arboreous vegetation (including an account of the fate of a tropical forest), extinction in

wild state of plants of economic value, introduction of ornamental plants which become wild, and weeds. Weeds are considered as follows: (1) relation to human migrations; (2) methods of introduction,—(a) in pot plants, (b) with seeds of cultivated plants, (c) by transport of cattle, (d) in packing material, ballast and cargo of ships; (3) accounts of dissemination of particular weeds; (4) qualities affecting rapidity and distance of travel.—The most widely distributed plants are weeds, sea-dispersed species, and those with bird-carried seeds. Dispersal by sea is superior both in time and distance to that by wind. The reasons for the very wide distribution of certain species of flowering plants and the course of their dissemination is discussed.—Endemics are divided into 2 easily distinguishable groups, (1) relics of a lost flora and (2) species evolved in 1 locality which have spread no further. Many examples of the difficulty of interpreting distribution on the basis of the age-and-area theory are pointed out particularly in regard to weeds where the actual histories of dissemination are known, and in regard to such plants as Cycads, *Sequoia*, *Salisburia*, *Platanus*, etc.—*W. P. Thompson.*

6254. Romieux, Henri. **Sur la florule de la Vallée de Couches (Valais). [The flora of the Vallée de Couches (Valais).]** Bull. Soc. Bot. Genève **13**: 31. 1921.

FOREST BOTANY AND FORESTRY

W. N. Sparhawk, *Editor.*

(See also in this issue Entries 6203, 6216, 6237, 6461, 6516, 6517, 6539, 6644, 6652, 6658, 6671, 6680, 6693, 6694, 6710)

6255. Anonymous. **Denkschrift des badischen Ministeriums der Finanzen—Forstabteilung—über Waldstreuabgabe und Waldbewirtschaftung. [Memorandum of the forest section of the Baden Ministry of Finance, on utilization of forest litter.]** Forstwiss. Centralbl. **45**: 107–120. 1923.—As forests are now the chief sources of revenue for several German states, and as there is a great shortage of timber and fuel, it is essential to maintain maximum yields. The practice of granting farmers the right to remove leaf litter for bedding stock, which developed to great proportions during the war, must be restricted or eliminated if possible. The productivity of forest soil depends to a great extent upon the presence of a loose cover of decaying vegetation, which retains moisture, keeps the soil loose and permeable, keeps the fine soil particles and plant food from leaching out or washing away, helps to break down the soil into available plant food, and harbors a multitude of minute life which is indispensable for thrifty forest growth. The volume of bacteria, fungi, protozoans, worms, and insects on a hectare of undisturbed forest soil has been estimated at 1,000–2,000 kgm. or as much as the weight of domestic animals kept on an equal area. Soil culture can accomplish far more than culture of the timber stand in increasing forest yield. In numerous instances continued removal of litter has resulted in retarding growth and even in reducing once thrifty forest to mere scrub. Not only are height, diameter, and volume growth affected, but natural regeneration becomes difficult or impossible, and the forest becomes more susceptible to damage by insects and disease. Experiments over 27 years in Bavaria showed 50 and 30 per cent reduction in yield of beech and pine respectively when the litter was removed; 80-year examples show yields 3–3¾ times as great where litter was left on the ground, as compared with stands from which it was removed; 14-year records in Baden showed losses in increment of 11–16 per cent due to removal of litter. In the first 6 months of 1922, about 350,000 cubic m. of litter was taken from the forests of Baden. Each cubic m. represents a lost increment worth 3,000 marks (October, 1922, values), making the total loss 1 billion marks. While some litter may still be taken from forest roads and fire lines, the bulk of the demand should be met by substitutes, especially conifer twigs and peat. A confirmation of the statements in this memorandum is appended over the signature of the Forest Institute of the University of Freiburg.—*W. N. Sparhawk.*

6256. Allen, E. T. **America's transition from old forests to new.** Amer. Forest. **29**: 163–168, 235–240. *12 fig.* 1923.—This article outlines the destruction by fire, the popular indifference, the vast and mushroom growth of the Middle West with its stimulating demand

for lumber, and finally the period of occupation of the western forests, both governmentally and individually, described as the most defined and pregnant of American forest history. The concluding instalment describes the natural development of forest resources and forest policies in the West, and shows the inevitable drift toward a just and sound national forest policy.—*Chas. H. Otis.*

6257. Baltz, Carl. **Die Förster der Kommunalverbände, öffentliche Anstalten, gemeinschaftlichen Holzungen und Waldgenossenschaften. [Foresters of communal organizations, public institutions, community forests, and forest associations.]** Zeitschr. Forst.- u. Jagdw. 54: 339–348. 1922.—The author defines and clarifies the status and prerogatives of the foresters of the various classes in the light of the municipal officer statute of July 30, 1899, and laws and ordinances of December 24, 1816, August 14, 1876, and October 12, 1897. —*J. Roeser.*

6258. Beals, E. A. **Discussion of thunderstorms and forest fires in California.** Monthly Weather Rev. 51: 180–182. *1 fig.* 1923.—The difficulties in forecasting storms are pointed out, and the need for further study of forecasting is emphasized.—*E. N. Munns.*

6259. Bergmann, M. **Gedanken zur Bonitierung im Dauerwald. [Suggestions on classifying site qualities.]** Deutsch. Forstzeitg. 38: 184-185. 1923.—Quality of forest sites may be classified on the basis of height and volume growth, or according to the composition and condition of the soil itself. Height and volume growth depend upon the industry and skill of the forester, while chemical and physical analyses of the soil are hardly practical and do not show the amount of plant food actually available. The native vegetation affords a reliable index of site quality, providing allowance is made for variations in density of forest cover, as the indicator plants under a dense canopy are not the same as those under an open stand on the same site.—*W. N. Sparhawk.*

6260. Berlin. **Zu "Betriebsregelung im Dauerwalde." [Concerning "Betriebsregelung im Dauerwalde."]** Zeithschr. Forst.- u. Jagdw. 54: 309–316. 1922.—The author describes the silvicultural conditions in the forest of Wabel, which has recently been placed under the continuous system of management by the state, and outlines the form of management and control book. The stand is one of almost pure pine, in which most of the old trees have been destroyed by insects. The management form employed is somewhat simpler than that used at Bärenthoren and described by Wendroth [see Bot. Absts. 12, Entry 5593]. Although most advocates of the continuous system consider age-class distinctions worthless, the author finds the construction of age-class tables from the management book a matter of only a few hours extra work, and they provide a second regulator for the determination of cut and yield. The construction of a yearly cutting plan is also deemed necessary.—*J. Roeser.*

6261. Birner. **Die Wirtschaftsführung in einem vormaligen Auemittelwalde. [The management of a former coppice-with-standards forest on meadowland type.]** Zeitschr. Forst.- u. Jagdw. 54: 290–305. 1922.—The Grünewald forest is threatened with destruction, since it lies in the overflow territory of the Elbe on land desired for farming. The variation between maximum and minimum soil moisture is the greatest in any forest type. The soil is very productive, but when the water is lowered the loam soil becomes almost impervious and vegetation must depend upon atmospheric moisture, which here is lower than elsewhere in Germany. The original silvicultural system was coppice-with-standards, the principal species being elm and pedunculate oak. As the demand for lumber replaced that for fuelwood, the old system was abandoned (1884) for the high-forest system. Contrary to common opinion, it was discovered that the best high-forest stands of elm developed from root sprouts and the typical plan of management now calls for reproduction of elm by root sprouts and filling in after 2 years with ash nursery stock. Greatest care should be exercised in selecting seed for sowing from stands of straight-boled trees. The present form of management is shelter-wood selection with group reproduction.—*J. Roeser.*

6262. Bronsart, von. **Zu "Gedanken aus dem Walde" von Oberförster A. D. Fricke in Januarheft.** [**In re "Gedanken aus dem Walde"** (see Bot. Abst. 12, Entry 5531) **by forest superintendent A. D. Fricke.**] Zeitschr. Forst.- u. Jagdw. **54:** 365–366. 1922.—The controversy between advocates of continuous forest management and of clear-cutting methods has primarily concerned management form only, rather than the more important consideration of soil fertility. Soil care should be the starting point in forest management, and clear-cutting must be avoided; but whether the even-aged high forest or the selection forest shall be retained is immaterial, as maintenance of soil fertility is possible under both forms. To secure and maintain fertility, the chief demand of future management will be to protect the soil from wind, mainly by establishing effective protection screens around the borders of the forest. Other protective methods, such as understory and advance reproduction, will depend upon local factors. With proper treatment of the soil and of the stand, fungous and insect calamities, which now so often threaten to pass beyond control, will gradually be checked.—*J. Roeser.*

6263. Brown, Thos. W. **A report on forestry and horticulture in Palestine.** In: **A review of the agricultural situation in Palestine.** Part II, *p. 7–16.* Government publication: Haifa, Palestine, 1923.—Aleppo pine is the most valuable timber tree in Palestine, but the cypress (*Cupressus sempervirens* L.) should be cultivated much more than at present. Several species of eucalyptus are cultivated, of which *E. resinifera* Sm. seems to be the best. Carob-trees (*Ceratonia siliqua* L.) are more properly regarded as fruit or fodder trees than as timber, as the pods contain a large amount of sugar. The writer speaks of the various stocks for grafting oranges. He recommends the introduction of sisal as a source of fiber.—*John E. Dinsmore.*

6264. Butler, O. M. **Seating the Nation.** Amer. Forest. **29:** 216–217, 244. *2 fig.* 1923. —The article concerns chairs and the great and needless waste of wood incurred in their manufacture.—*Chas. H. Otis.*

6265. Clapp, E. H. **The long haul from the woods.** Amer. Forest. **30:** 259-264, 320. *7 fig.* 1923.—This article traces the increased cost of lumber transportation from early times to the present, as large-scale logging in the U. S. A. has passed from East to West and the short hauls have given way to trans-continental freight shipments.—*Chas. H. Otis.*

6266. De, R. N. **Germination of Barringtonia acutangula seeds.** Indian Forester **49:** 268–270. 1923.—The seed float on the flood waters of shallow lakes and rivers until they come to rest during the subsidence of the flood. After germination and early growth, especially after a year, they can again stand submergence, though if covered too deeply they may not survive.—*E. N. Munns.*

6267. Denzin. **Die Zerlegung der Mischbestände nach Teilflächen.** [**The parcelling of mixed stands.**] Zeitschr. Forst.- u. Jagdw. **54:** 330–339. 1922.—The author replies to Trebeljahr's critique [see Bot. Absts. 12, Entry 2395] of his previous paper [see Bot. Absts. 11, Entry 2354]. Trebeljahr considers the parcelling of mixed stands even from the purely theoretical standpoint to be impossible. His view, that the working sections defined by the Prussian management-plan instructions of 1912 are not true working sections, as recognized in forestry, is based on a false concept. The method prescribed in the 1912 instructions is based on clearer and more reliable facts, is simpler, secures a better arrangement and more orderliness in the stand, and requires less control calculations by the officer in charge than do the instructions of 1919. In fact, Trebeljahr's condemnation applies to his system more than it does to the instructions of 1912.—*J. Roeser.*

6268. Endres. [Rev. of: Hedler, Walter. **Deutschlands Forst.- und Nutzholzwirtschaft in und nach dem Weltkriege.** [**German forest and timber administration during and after the war.**] *119 p.* Reichenbachsche Verlagsbuchhandlung: Leipzig, 1921.] Forstwiss. Centralbl. **45:** 63–68. 1923.—Hedler is a military man, not a forester. His book would have

been satisfactory had he stopped with a description of the war-time regulation of forest industries. His treatment of silvicultural and economic matters only betrays his ignorance. Its central thought appears to be that German forestry can function effectively only under the direction of Major Hedler.—*W. N. Sparhawk.*

6269. Escherich, K. **Parasitenwirkung und biologische Bekämpfung. [The work of parasites and the biological combat method.]** Zeitschr. Forst.- u. Jagdw. **54**: 193–198. 1922.—The author discusses Knoche's criticism of his book and other works advocating the fighting of destructive insects by their natural enemies (biological method), and summarizes briefly his present view of the parasite situation. He asserts that the intensive culture of a host plant has the same significance as the importation of a destructive insect into a country where the parasites which tend to control its spread are missing. Reference is made to the brown-tail and gypsy moth calamities in America. By returning to more natural conditions in forest management and producing more mixed forests in preference to pure stands, the author believes that conditions will favor the natural parasitic enemies of destructive insects and thus lessen the danger from these insects. The recent tendency in forest management seems to be in this direction, due in part, at least, to the ever increasing destruction of forests by insects.—*J. Roeser.*

6270. Ettinger, J. **A note on the comparative merits of the stone and the Aleppo pine.** In: **A review of the agricultural situation in Palestine.** Part II, *p. 25–26.* Government Publication: Haifa, Palestine, 1923.—A detailed botanical and economic comparison of the 2 species of pine found in Palestine (*Pinus pinea* L. and *P. halepensis* Mill.) includes directions for propagation, cultivation, and spacing of the stone pine.—*John E. Dinsmore.*

6271. Eulefeld. **Die Durchlüftung des Waldbodens oder Aufhebung der Wurzelkonkurrenz. [Ventilation of forest soil or prevention of root competition.]** Deutsch. Forstzeitg. **38**: 460–461. 1923.—Loosening the soil to let in the air, by plowing or otherwise, stimulates growth, just as cultivation does with farm crops. Growth stagnation is not due primarily to root competition, as some investigators believe.—*W. N. Sparhawk.*

6272. Fabricius. [Rev. of: Rebel, Karl. **Waldbauliches aus Bayern. [Silvicultural notes from Bavaria.]** *293 p.* Jos. C. Hubers Verlag: Diessen vor München, 1922.] Forstwiss. Centralbl. **45**: 68–76. 1923.—The author presents his observations resulting from 14 years in a responsible position in the Bavarian service. While the reviewer does not agree with all of his statements and conclusions, he considers the book an exceedingly valuable contribution to silvicultural knowledge.—*W. N. Sparhawk.*

6273. Fabricius, L., und Hans Fr. Gross. **Heizwert und Wärmepreis der Brennhölzer. [Heating value and price of fuelwood.]** Forstwiss. Centralbl. **45**: 83–100. 1923.—The method of measuring heat values by the bomb calorimeter is described, and a table shows heat units per kgm. and per cubic m. of air-dry wood of various species. Reduction factors are given for computing the heat values for stacked wood of several grades. The conifers generally have greater heating value per kgm., but the greater specific gravity of the hardwoods more than compensates for the difference. With increasing age of tree the heating value per unit weight increases, while the density of the wood decreases. Except for pine, the heating value of fungus-infected wood is practically as great as that of sound wood. The proper price to be paid for fuelwood, in comparison with that for coal, can be computed on the basis of available heat units.—*W. N. Sparhawk.*

6274. Forbes, R. D. **The passing of the piney woods.** Amer. Forest. **29**: 131–136, 185–186. *7 fig.* 1923.—Annually ¾ million acres of pine land, chiefly in the Gulf Coast Statesl are stripped so clean and then burned so thoroughly as to be incapable of satisfactory natura, reforestation within half a century, and some will undoubtedly take more than a century. If forestry were practiced it is believed that, with a lapse of only a few years following the

exhaustion of the important virgin stands, an annual cut of 6–8 billion board feet of southern pine could be counted upon indefinitely. If forestry is not practiced the annual cut will become less and less, and the price of lumber higher and higher.—*Chas. H. Otis.*

6275. Fritz, Francis M. **The elfin forest of California.** *267 p. 123 fig.* Times-Mirror Press: Los Angeles. 1923.—This is a popular account of the chaparral forest region of southern California, giving briefly the importance of the chaparral in preserving the water supply and the soil on the mountains, as well as an account of the various trees, shrubs and flowers found in the region.—*E. N. Munns.*

6276. Guibier, H. **L'amenagement des forêts en Indochine.** [**Forest management in Indo-China.**] Bull. Econ. Indochine **24**: 491–585. *Illus.* 1922.—This is a comprehensive, well illustrated consideration of forestry and forestry conditions in Indo-China.—*E. D. Merrill.*

6277. Harrer. **Produktionssteigerung im kleinen Privatwald.** [**Increasing the production of small private forests.**] Forstwiss. Centralbl. **45**: 41–52. 1923.—An essential part of the program of increasing German timber production is to increase production from small private holdings which are not now managed for continuous production. These tracts, which include about ½ of the private forests in Germany, or between 3 and 4 million hectares, do not yield much over 1 cubic m. of wood per hectare per annum, while under proper management the yield could be increased by at least 2 cubic m., worth 15 gold marks per cubic m. This increase can be brought about by introducing fast-growing species, particularly Douglas fir, by lengthening the rotations and producing a greater proportion of stem wood, and by coordinating management. The owners individually cannot accomplish it, consolidation of holdings is impracticable, and state ownership out of the question; hence the only practicable means is through the formation of forest cooperatives, managed under state supervision, with membership compulsory for all small owners whose forests do not admit of sustained yield management by themselves.—*W. N. Sparhawk.*

6278. Hohenthal, Georg. **Dauerwald und Privatwaldbesitz.** [**The continuous forest and private forest ownership.**] Zeitschr. Forst.- u. Jagdw. **54**: 364. 1922.—A private owner disagrees with Roth. While acknowledging that the continuous forest is correct in principle, he advocates caution in adopting it on private holdings, since its success depends largely upon the experience and ability of the forester in charge. Hohenthal predicts increasing popularity for the system under private management, even though it requires more ability on the part of the forester than does the schematic clear-cutting system.—*J. Roeser.*

6279. Hosmer, R. S. **Town forests and community chests.** Amer. Forest. **29**: 155–157. *4 fig.* 1923.—This article describes European town forests, the income from which goes to the support of hospitals, libraries, museums and other quasi-public institutions, and shows how similar forests could be utilized in America.—*Chas. H. Otis.*

6280. Junack. **Bekämpfung von Waldbränden.** [**Fighting forest fires.**] Deutsch. Forstzeitg. **37**: 784–787. 1922.—Methods are described for trenching, back-firing, patrol, and final extinguishing of fires.—*W. N. Sparhawk.*

6281. K., S. Z. **Fortschritte auf dem Gebiete der Färbung stehender Bäume.** [**Progress in coloring standing trees.**] Deutsch. Forstzeitg. **37**: 770. 1922.—After 10 years' experimentation, Reimann has developed a practical process for coloring the wood of standing trees. The coloring matter, a dilute aniline dye, is introduced near the base of the tree by means of a specially constructed borer and a 100-l. container operating by pressure of the contained liquid. In 2 days the color penetrates even to the foliage. In 8 days more the tree is felled, and 8 days later it is sawed up. Penetration is uniform, and the process gives promise of great economic importance.—*W. N. Sparhawk.*

6282. Katzer, K. **Zur Gliederung der Forstwissenschaft in Produktionslehre und Betriebslehre. [On the division of forestry into the branches of production and operation.]** Forstwiss. Centralbl. **45**: 100–107. 1923.—The 3 main subdivisions of forestry are: technical forestry, including production and utilization; economic forestry; and forest administration.—*W. N. Sparhawk.*

6283. Kirkland, B. P. **The iron horse of the West.** Amer. Forest. **29**: 205–209. *5 fig.* 1923.—It is pointed out that the Pacific Northwest contains the last great stand of old coniferous forests yielding large percentages of clear, first-quality timber. The typical old forest of the Northwest does not exceed 300–500 years in age, although in some limited areas fires appear to have been absent for periods as long as 1,000 years. The forests were from the start in ideal condition for management; but no time should be wasted in establishing young stands following logging operations, since such negligence will result in depletion of growing stock and inevitable future reduction of annual cut. A short history of the lumber industry is given, leading to the statement that at present rates of cutting, privately owned old timber in western Washington will be entirely cut in 20–30 years, with Oregon and California following later. Foresight and intelligence are needed to bring about a continuous yield. The writer believes that, given proper management, the forests of western Washington should give an annual production forever of approximately 6 billion feet of saw-timber and 6 million cords of other forest material.—*Chas. H. Otis.*

6284. Kitson, Lela C. **The piñon.** Amer. Forest. **29**: 158–159. *2 fig.* 1923.—Popular. —*Chas. H. Otis.*

6285. Lemmel. **Das Problem der volkswirtschaftlichen Produktivität und seine Stellung in der Staatsforstwirtschaft. [The problem of economic productivity and its significance in state forestry.]** Zeitschr. Forst.- u. Jagdw. **54**: 199–226. 1922.—The author discusses the problem in its relation to state forest management. The big question to be answered is: which production method most fully satisfies the economic interests of the nation? The technical, economic, financial, and highest soil rental rotations are considered separately. The last chapter considers the relation of the previously discussed economic principles to the business of the state; briefly, whether state management should be directed toward securing financial gain or toward social or community betterment.—*J. Roeser.*

6286. McCarthy, E. F. **Forest fire weather in the Southern Appalachians.** Monthly Weather Rev. **51**: 102. *2 figs.* 1923.—The relationship of temperature, humidity, evaporation, precipitation, and vapor pressure to the occurrence of fires from September to November, 1922, is pointed out. The fact that Weather Bureau data can be translated into usable information regarding the fire situation shows the value of graphic studies of existing records. —*E. N. Munns.*

6287. McLoud, N. C. **Holding the banks of the Mississippi.** Amer. Forest. **29**: 242–243, 249. *3 fig.* 1923.—The author describes the making of willow mats, sometimes as large as 250 by 1,000 feet and their use as revetments to stop erosion and cutting of the banks of the Mississippi River.—*Chas. H. Otis.*

6288. Madlung. **Wirksame Verdrängung der Heide durch die perennierende Lupine. [Suppressing of heather by means of perennial lupine.]** Deutsch. Forstzeitg. **38**: 324–327. 1923.—Lupine sowed between the rows in oak nursery beds, and scattered broadcast on bushy areas on exposed sites, has proved very effective in keeping down the growth of weeds and heather, and at the same time stimulates the growth of the young trees. It furnishes forage for wild game during the fall and winter, and its blue flowers are of great esthetic value.—*W. N. Sparhawk.*

6289. Milner, C. E. **A visit to Myitmaka training works, Burma.** Indian Forester **49**: 175–182. *Pl. 7–8.* 1923.—An account is presented of a project to reclaim lowlands and to develop a stream suitable for floating logs.—*E. N. Munns.*

6290. Mobbs, E. C. **The management of high forests in the Vosges and Jura Mountains.** Indian Forester 49: 183–197. 1923.—The author gives an account of a trip through the French forests.—*E. N. Munns.*

6291. Möller. **Allgemeine Wirtschaftsgrundsätze.** [General principles of management.] Zeitschr. Forst.- u. Jagdw. 54: 243–250. 1922.—Möller makes public 2 communications, one from the chief forester of Stettin, the other from the Department of Agriculture and Forestry of Prussia, in relation to the management of forests in the plains region of northwest Germany. The principles of the continuous management system (avoidance of clear-cutting, natural regeneration, and soil culture and protection) are prescribed. The latter edict enters into considerable detail; demands, in general, the prevention of further soil deterioration (raw humus formation), the reduction of the amount of dry peat deposits, and the conversion of undesirable stands, especially pure conifer stands, into mixed stands of conifers and hardwoods.—*J. Roeser.*

6292. Oelkers. **Die Aufforstungen in der Lüneburger Heide.** [Afforestation on the Lüneburger heath.] Deutsch. Forstzeitg. 37: 800–803. 1922.—Hanover, which is 18 per cent forested, has 138,835 hectares of moorland, half of all there is in Prussia; 98 per cent of it is privately owned. Over 23,000 hectares has been afforested by the provincial government, communes, and private owners. Planting was done on plowed strips, using 1-year pine and 2-year spruce seedlings, and seeds of pine, spruce, and larch. Along paths and roads, protection strips of oak, birch, maple, and alder were planted. Shallow plowing and seeding proved more successful than deep plowing and planting. The common method is to burn during the 1st winter at a time when only the heather will be burned and the humus will be left intact, harrow the ashes into the soil, plow 20 cm. deep the 2nd year, and sow the seed in the 3rd spring.—The cool, damp climate, the absence of lime in the soil, and the cultivation of pure conifer stands tend to cause the formation of hardpan and upland moors. Remedies include cultivation of mixed stands, early and heavy thinning, removal of litter. Introduction of beech, fir, and larch has stimulated growth of the pine.—*W. N. Sparhawk.*

6293. O[smaston], A. E. **A review.** [Rev. of: (1) Chapman, H. H. **Forest mensuration,** *xxii+ 553 p.* J. Wiley & Sons: New York: Chapman and Hall, Ltd.: London, 1921 (see Bot. Absts. 12, Entry 1695). (2) Winkenwerder, Hugo, and E. T. Clark. **Handbook of field and office problems in forest mensuration.** *2nd ed., 133 p.* J. Wiley & Sons: New York, 1922.] Indian Forester 49: 82–93. 1923.—Both books are worth reading and keeping for reference. Many of the American problems are closely akin to those of India. It is difficult at first reading to understand the American terminology. [See also Bot. Absts. 12, Entries 393, 2354.]—*E. N. Munns.*

6294. Parker, R. N. **Artocarpus hirsuta as an underwood for teak.** Indian Forester 49: 248–251. 1923.—Usually *A. hirsuta* has failed in sowings under teak, but success attended broadcast sowing followed by hoeing and covering of the seed. Growth was rapid on established trees, the maximum being 38 inches in girth at 18 years. Five teak standards and 83 *A. hirsuta* saplings were found on a "square chain." When the 2 species are introduced together, it is doubtful as to which will form the final stand.—*E. N. Munns.*

6295. Parker, R. N. **Natural regeneration of Eucalyptus.** Indian Forester 49: 251-252. 1923.—Natural seedlings of *E. dealbata* and *E. globulus* were found after a severe fire on an area where *Pinus longifolia* had been destroyed by fire.—*E. N. Munns.*

6296. Piccioli, Elvira. **Richerche sperimentali su legni stranieri, mogano, Cedrela.** [Researches on foreign woods, mahogany, Cedrela.] Staz. Sper. Agrarie Ital. 55: 51–79. *6 fig.* 1922.—This article discusses the characteristic differences between the genera *Swietenia* and *Cedrela.* It includes information on the source of the principal commercial species sold as mahogany or cedrela, the quantities imported, their technical properties, uses, and dis-

tinguishing anatomical characteristics. Figures drawn from microtome sections, in 3 planes, are shown for *Swietenia mahagoni* and *Cedrela odorata* respectively.—The following species of *Swietenia* are discussed: *S. angolensis* Welw., *S. humilis* Zucc., *S. macrophylla* King, and *S. mahagoni* Jacq. The common and trade names used in different countries are cited. A very detailed discussion of the anatomical characteristics of *S. mahagoni* is given which includes vessel and ray-cell dimensions. A classification of mahoganies into 5 groups based on the characters of the rays and their contents is presented. A brief historical account of the early recognition and exploitation of mahogany mentions the Europeans landing in America in 1597 from the Walter Raleigh as the first to become acquainted with it, and cites its use by Spaniards in ships, and its importation into England in 1724 by Capt. Gibbon. It states that in 1753, 520,000 cubic feet was imported from Jamaica and before the recent war about 12,000 tons a year was imported by France, 70,000 by England, and 7,000 by Germany. The tree was introduced into India in 1795 and is now cultivated to a considerable extent. The best grades now come from mountain slopes in southern Mexico, British Honduras, and Guatemala. Strength figures are quoted from Laslett and Sargent.—The following woods which may be sold as mahogany, but which do not come from *Swietenia* are discussed: *Curatella americana* L., *Ratonia apetala* Griseb., *Anacardium occidentale* L., *Simaruba amara* Aubl., *Tabebuia Donnell-Smithii* J. N. Rose, *Khaya senegalensis* A. Juss., *K. grandifolia* C.DC., *Entandrophragma Candollei* Harms., *Dysoxylon Muelleri* Benth., *Soymida febrifuga* Juss., *Eucalyptus botryoides* Sm., *E. marginata* Sm., *E. pilularis* Sm., *E. resinifera* Sm., *E. robusta* Sm., *Juglans regia* L., *Ptaeroxylon utile* Eckle. & Zeyn., *Boswellia* sp., *Persea indica* Spreng., *Myristica* sp., and a number of species of *Cedrela*. Methods of finishing such woods as maple, walnut, locust, poplar, chestnut, and elm to look like mahogany are given as follows: (1) oxide of titanium, potash and gall nuts, (2) infusion of Brazil wood, (3) infusion of logwood, (4) infusion of seed of *Bixa orellana* L., (5) gommagutta or saffron, (6) dilute nitric acid followed by an alcoholic solution of the resin from the fruit of *Daemonorops draco* Blume (dragon's blood), root of *Anchusa tinctoria* L., and aloe.—Thirty-five species of *Cedrela* and their sources are mentioned. The following are discussed in detail: *C. odorata* L. and its varieties, *C. bogotensis* Triana & Planch., *C. fissilis* Vell., *C. guianensis* Juss., *C. inodora* Hassk., *C. sinensis* Juss., and *C. toona* Roxb. The article closes with a page summary of the characteristics in regard to color, odor, taste, hardness, annual rings, specific gravity, and structure of vessels, fibers, wood parenchyma, and rays, which serve to distinguish *Swietenia mahagoni* and *Cedrela odorata*.—*Eloise Gerry.*

6297. Randall, C. E. **Farming the forest for a pine crop.** Amer. Forest. 29: 195–198, 250. *5 fig.* 1923.—This article points out the financial value of white pine plantations as paying investments to farmers and to towns, with a warning of the dangers to the crop, and especially of the white pine blister rust.—*Chas. H. Otis.*

6298. Record, S. J. **The Paraná pine of Brazil.** Amer. Forest. 29: 215. *1 fig.* 1923.

6299. Record, S. J. **When we build our house.** Sci. Amer. 128: 80–81. *5 fig.* 1923.—This popular article gives facts regarding kinds and grades of lumber which should be known by the home builder.—*Chas. H. Otis.*

6300. Record, S. J., and George A. Garratt. **Cocobolo.** Yale Univ. School of Forest. Bull. 8. *42 p., 7 pl., 1 fig.* 1923.—The authors identify the wood of commerce under this name with the genus *Dalbergia*, and 3 species, *D. retusa* Hemsley, *D. hypoleuca* Pittier, and *D. granadello* Pittier, indigenous in Panama and the west coast of Costa Rica, Nicaragua, Honduras, and Mexico. Botanical descriptions, macroscopic and minute anatomy of the woods, commercial sources of supply, methods of exploitation, and uses are given. For cutlery handles, no satisfactory substitute for cocobolo has been found. The annual consumption is 80,000 cubic feet.—The dust of the wood in factories causes a skin eruption similar to that caused by poison ivy. From 10 to 20 per cent of workmen are susceptible. The toxic principle is an oleoresin with violent irritant properties capable of producing an inflammatory

condition of the skin of the type of "dermatitis venenata." It is soluble in alkalies but is precipitated by acids. The trouble is rarely of a serious nature and usually responds promptly to treatment.—*H. H. Chapman.*

6301. Rhodes, G. H. **Perpetuating the redwoods.** Amer. Forest. 29: 147–152. *5 fig.* 1923.—California stands among the leading states in regard to constructive forest laws, having begun to formulate them as early as 1885. Reforestation in the redwood region began in 1843, when the first sawmill was built in Mill Valley; for, as soon as the redwood trees were cut, sprouts sprang from the stumps, and at present there are 10 or more good trees where 1 stood in the virgin forest. Since lumbering began, approximately ⅓ of the virgin forest area has been cut over and approximately ¼ of this has been cleared for farming. At the present rate of cutting, the remaining timber will last 140 years. An increased rate may reduce the time to 70 or 100 years. Second-growth redwood is flourishing on practically all the cut-over land that is not being farmed. The age of this new timber is 1–75 years and there are stands with as high as 130,000 board feet to the acre. While the second growth redwood will not be as large when cut for lumber as are the trees of the virgin forests, the stand will be much more dense and uniform, making the yield per acre greater than the average yield from the virgin forests. Both virgin timber and second growth are protected from loss and fire damage by the owners, individually and through co-operating associations, ably assisted by the counties and the State Board of Forestry. In 1921 the area burned over was 4,260 acres, with a loss of only $1.04 an acre.—*Chas. H. Otis.*

6302. Ricalton, J. **Russian white birch—rare tree of a thousand uses.** Amer. Forest. 29: 153–154. *2 fig.* 1923.—This is a popular article on *Betula alba*, its growth under Russian conditions and its use by the peasantry.—*Chas. H. Otis.*

6303. Sch. **Bestimmungen über Waldabtriebe in der Tschecho-Slowakei. [Regulation of cutting in Czechoslovakia.]** Deutsch. Forstzeitg. 38: 363–364. 1923.—Forest owners who are not operating under a fixed working plan are required to notify the proper officials 4 weeks in advance of intended cutting. Cutting is not allowed in stands less than 60 years old in case of high forest, and 20 years for coppice or coppice-with-standards. The area cut over yearly may not exceed $\frac{1}{60}$ for tracts of high forest under 50 hectares, or $\frac{1}{80}$ for larger tracts; for coppice the limits are $\frac{1}{20}$ and $\frac{1}{30}$, respectively.—*W. N. Sparhawk.*

6304. Sch. **Mecklenburgisches Waldschutzgesetz. [Mecklenburg's forest protection law.]** Deutsch. Forstzeitg. 38: 315. 1923.—Mecklenburg-Schwerin adopted a forest protection law on March 10, 1923. It provides that cut-over land must be restocked within 3 years; existing denuded land suitable for forest production must be replanted; no further forest destruction is allowed; owners of less than 25 hectares of forest may manage it as they please; the owner of 25–100 hectares must secure the approval of the authorities if he intends to cut over more than 4 per cent of the area in any 1 year; and the owner of over 100 hectares must follow an approved working plan, under the guidance of a trained forester, unless he himself can qualify as a forester.—*W. N. Sparhawk.*

6305. Schneider. **Die Buchenschildlaus (Cryptococcus fagi) in der Revierförsterei Burgsteinfurt i. W. [The beech scale.]** Deutsch. Forstzeitg. 38: 305–308. 1923.—The damage resulting from attacks of this insect is discussed, and methods of control are suggested. —*W. N. Sparhawk.*

6306. Seitz. **Fraget die Eichen, wie sie wachsen. [Ask of the oaks, how they grow.]** Zeitschr. Forst.- u. Jagdw. 54: 321–330. 1922.—The author discusses the retrogression of native oak stands (*Q. pedunculata* and *Q. sessiliflora*) and the problem of preserving and extending good stands. Because of overlapping of sites and flowering periods, hybrid races have been produced. Racial variation studies such as have been made with pine should be undertaken with the oaks. Foresters are concerned chiefly with the dominance of characteristics influencing the habit of the tree, and with selecting and propagating those individuals which express the desired characteristics and can pass them on to their progeny.—*J. Roeser.*

6307. Show, S. B., and E. I. Kotok. **The occurrence of lightning storms in relation to forest fires in California.** Monthly Weather Rev. 51: 175–180. *Fig. 1–4.* 1923.—In the 10-year period 1911–1920, 77 per cent of the fires caused by lightning occurred in July and August, which are also the months of highest temperature. Most storms cause relatively few fires, but as high as 339 fires have been set by a single storm. Well defined areas, "lightning zones," exist where fires are frequently set, in which there is a striking parallelism in heavy storms. A series of maps shows these features.—*E. N. Munns.*

6308. Sudworth, G. B. **The age of Monterey cypress.** Amer. Forest. 30: 270–271. *3 fig.* 1923.—Popular.—*Chas. H. Otis.*

6309. Sweet, C. V. **Further experiments in the air-seasoning of Indian timbers and general recommendations as to seasoning methods.** Indian Forest Rec. 9[5]: 147–226, 241–288. *Pl. 1–6.* 1922.—Natural methods of seasoning timber are possible for most of the important Indian species, though kiln drying is much more satisfactory. Seasoning in the log is generally unsatisfactory because of splitting and checking. The best results are obtained from green conversion if the timber is handled soon after cutting and properly stacked and protected, though many species may be girdled 18 months in advance to facilitate handling. Those that are severely damaged by insects should ordinarily not be treated in this way. When logs can not be sawn immediately, special precautions should be taken to prevent damage, water storage being the best method. Good seasoning depends largely upon the degree of protection given the lumber from sun and wind, and the season of cutting, while the rate varies markedly with the species and with the local climate. Complete data are given for 53 species.—*E. N. Munns.*

6310. Treschow, von. **Forstwirtschaftlicher Rückblick auf das Jahr 1921.** [**Forest economic review for 1921.**] Zeitschr. Forst.- u. Jagdw. 54: 257–289. 1922.—The review takes up the economic situation of forest industry in Germany under the following headings: the general economic situation, which in 1921 was one of the darkest in German history; conditions of the construction market; indemnity payments of forest products; the course of lumber prices; the situation in the most important countries exporting lumber to Germany; economic measures, including the problem of increasing the cutting budget; the economic situation in East Prussian forests; organization and legal questions; silvicultural questions, mainly centered upon the discussion of the continuous management system, which is beginning to receive the eager attention of private owners; the oak tan-bark question; secondary forest products; and a financial statement and summary of Prussian forests. In 1918 expenditures amounted to 39 per cent of receipts; in 1919, 34; in 1920, 13; in 1921, 34, and in 1922, 42 per cent. Through the Versailles treaty 636,000 hectares have been lost, the present area of the Prussian state forests being 2,416,008 hectares. Numerous tables are given.—*J. Roeser.*

6311. Vanselow. **Wirtschaftsziele und Wirtschaftsverfahren im Hochspessart.** [**Aims and methods of management in the Upper Spessart.**] Forstwiss. Centralbl. 45: 1–12, 53–63. 1923.—The objects and principles of management of the "High" Spessart from 1666 to the present time are described. This division of the Spessart forest contains 19,927 hectares, and the stand consists of hardwoods chiefly (80.4 per cent), including oak (17.3 per cent) and beech (63.1 per cent). The old oaks, 300–800 years old, which are famous sources of cabinet wood, are the result of the early form of management. The large-crowned oaks were left to form a forest cover and furnish mast, while the more slender, small-crowned oaks and the beech were taken out for the construction of castles and for firewood. Except for a few pure oak stands starting early in the 17th century, there was little reproduction of oak, hence the present scarcity of oak timber between 120 and 300 years old. About 1800 the silvicultural system was changed, using a form of shelterwood cutting, with an 80-year rotation for beech, later extended to 120–130 years. Natural reproduction of oak did not follow, but considerable was planted. In the late 1870's a selection method was adopted. For various reasons there was not sufficient young timber in the stand for this to be successful,

and the careless and destructive methods of logging and skidding destroyed a great deal of the reproduction which started. A strip- or "border"- cutting system, using the shelterwood method, is recommended. This will secure immediate natural reproduction of beech, and any openings should be planted with conifers.—*W. N. Sparhawk.*

6312. Vorkampff. **Baumhöhenmesser.** [A tree hypsometer.] Deutsch. Forstzeitg. 38: 244–245. 1923.—The instrument described is very simple to make, easy to use, yet sufficiently accurate. It does not require measurement of the distance between tree and observer.—*W. N. Sparhawk.*

6313. Wilson, Ernest H. **Northern trees in southern lands.** Jour. Arnold Arboretum 4: 61–90. 1923.—The paper deals with the introduction of trees of the northern hemisphere, chiefly North American and European, into South Africa, Australia, and New Zealand. After some remarks on the forest wealth and the forest problems of the southern lands, the behavior of northern soft-wood trees in the southern hemisphere is discussed. The most valuable is *Pinus radiata* D. Don, though it is of little importance in its native country; in most parts of the southern hemisphere where it has been planted it grows rapidly and yields 3 crops of merchantable timber per century. Other pines which have proved of value are *P. pinaster* Ait., *P. pinea* L., *P. canariensis* Smith, *P. longifolia* Roxb., *P. ponderosa* Dougl.; many of the Mexican pines also are doing well. *Pseudotsuga taxifolia* Brit. is promising in some parts of Australia as is *Larix decidua* Mill. *Cedrus* and several *Cupressus* and *Juniperus* species are growing well and are promising. Of little forestal value are *Abies, Picea, Tsuga, Chamæcyparis, Thuja, Cunninghamia, Cryptomeria* and others. None of the hardwood trees has proved of great importance, except poplar and willow; most others, though successfully used as ornamental and avenue trees, grow too slowly to be of value for forest planting. A chapter on southern trees in northern lands concludes the paper. *Eucalyptus* is named as the only one which has proved of great value in various parts of the northern hemisphere; while many others have been introduced, such as species of *Acacia, Grevillea, Leucadendron, Sophora, Araucaria, Cordyline;* they are planted chiefly as ornamental trees.—*Alfred Rehder.*

GENETICS

Orland E. White, *Editor*

(See also in this issue Entries 6142, 6184, 6197, 6217, 6220, 6225, 6231, 6232, 6233, 6251, 6253, 6373, 6381, 6384, 6392, 6415, 6455, 6456, 6457, 6458, 6480, 6481, 6511, 6533, 6647, 6703, 6704.)

6314. Bean, R. Bennett. **Notes on the body form of man.** 2nd Internat. Congress Eugenics. Vol. II. Eugenics in race and state. *7–19.* Williams & Wilkins Co.: Baltimore, 1923.—This paper deals chiefly with stature and sitting height, under the following heads: sitting height throughout the world; standards for stature, sitting height and sitting height index; morphologic index; American whites and negroes, and Filipinos; growth of sitting height; and the relation of sitting height to type. The materials include measurements by the author of 6,219 men, women and children, American whites and negroes, and Filipinos; records of other authors representing about 45,000 persons from 396 groups of peoples throughout the world. Two other groups have been reported by Giuffrida-Ruggeri numbering 44,929 Swedes and 119,571 Spaniards. In both sexes, Europe has the greatest sitting height, the Pacific Islands the least, America and Asia are next to Europe and Africa next to the Pacific Islands. The modal stature of the four great continental masses of peoples is represented by that of Europe and Asia, 165 cm. for ♂ with North America slightly higher, Africa much higher and Central America much lower. The records from Africa are not from the true negroes but are from mixed American, Bantu, Nilotic, Nigerian, etc., and the records from Central America are of Indians mixed with Spanish. The modal stature for ♀ is taken as about 155 cm. The modal standard sitting height for Europe, Asia, and North America is above 85 cm., and for Africa, Central America and the Pacific it is 85 cm. or less for the ♂. It is about 80 for the ♀. The modal sitting height index of Europe and America is about

52.5, of Asia 53.5, and of Africa 48.0–50.0. The sitting height index of the true negro is better represented by that of 9 groups from Central Africa with indices varying from 47.9 to 49.6. The normal standards are given for both ♂ and ♀ : (males) stature 165.0 cm., sitting height 85 cm., sitting height index 52.5; (females) stature 155.0 cm., sitting height 80 cm., sitting height index 53.5. The morphologic index is a number representing the percentage difference between racial means and a standard taken as a basis for computing the percentage difference. This standard should be as near the average of the 4 great masses of peoples as possible with present knowledge; it may have to be revised and may change in the course of time. The morphologic index may be used with any factor, either actual measurements or indices. The most distinctive characteristic of the morphologic index for stature is the low index for Central America and the Pacific. For sitting height the morphologic index is high for Europe, Asia, and North America, and low for Central America. The morphologic index for the sitting height index is high for Asia and extremely low for Africa. In the sitting height index for outlying groups, the lowest index is among the Australians and the highest among the Eskimos. Closely related to the Australians are the Negroes, Negritos, Melanesians, and East Indians; and closely related to the Eskimos are the Siberians, Chinese, Ainos, and Pigmies of Africa. A low index relates to the negroes except in the case of the Pigmies, and a high index to peoples of low stature who live under adverse conditions. The stature of the American whites and negroes is about the same, but that of the Filipinos is 10 cm. less. The sitting height of the three groups is different, the negroes being nearer the Filipinos than to the whites. The sitting height index is the same for the whites and Filipinos but it is lower for the negroes. The negroes are hybrid Afro-Americans with a preponderance of white blood. The Filipinos are from all parts of the Philippines, with a considerable Negrito blood but with a larger proportion of Chinese and European. The Chinese and Negrito neutralize each other because the former has a high sitting height index and the latter a low one, therefore the index is the same as for the European or white. The sitting height index is lowest in girls between the ages of 12 and 14, and in boys between the ages of 14 and 16. This is the period when the lower extremities are ceasing to grow rapidly and the torso or bust is beginning to grow rapidly. The bust of the girls is absolutely longer than that of the boys between the ages of 10 and 15. The period of most rapid growth in sitting height in girls is from 11 to 13 years, and in boys from 14 to 16 years; the girls are precocious and the boys retarded. The Asiatic seems to have a short youth and long adolescence, because the lower extremities are retarded early in their growth, and the bust is accelerated early and retarded late in its growth. The adult Asiatic has a long torso and short lower extremities. The African seems to have a long youth and a short adolescence, because the lower extremities grow to a late age and the rapid growth of the sitting height is late and short. The adult African has a short torso and long lower extremities. The European is intermediate between the Asiatic and African in the growth of both the torso and lower extremities. This varies with the type. Selected cases are given to show some extreme conditions that may be found among the American whites and negroes, and Filipinos. Then are separated those below 170 cm. stature, and finally each of the 3 primary types is subdivided into 3 other types. The records are all of ♂. The differences are readily seen, and, throughout the negro is discernible by reason of the lower index. Three types may be found among the people of any group but any clear separation of individuals is difficult and more or less relative. The extreme cases are easily discerned, but the intermediate grades are more difficult to detect.—*R. Bennett Bean.*

6315. Bell, Alexander Graham. **Saving the six-nippled breed.** Jour. Heredity **14**: 99–111. *10 fig.* 1923.—A summary is presented of Bell's experiments to produce a multi-nippled, twin-bearing strain of sheep. At the time of his death Bell had a flock that always bore twins and triplets, but whether the character is hereditary had not yet been satisfactorily proved.—*R. C. Cook.*

6316. Benders, A. M. **Onze constitutie. [Our constitution.]** Genetica **2**: 301–322. 1920.—The author discusses the Galenian theory of disease and its influence during centuries,

until Virchow in 1894 brought forth the organic (cell) theory; the effect of the latter on the advancement of the knowledge of diseases is considered.—The author accepts Lubarsch's definition of disease, "that tendency of the organism, which determines the manner of reaction to stimuli;" and of disposition, "that tendency of the organism, which enables external influences to act as stimuli." For example, scrophulous constitution; the disposition allows the tubercle bacillus to gain a foothold, and the constitution determines that the patient becomes scrophulous.—The theory of an hereditary constitution, determined at fertilization of the egg-cell, as advanced by Tandler, Hart and Hijmans van den Bergh, is discussed.—Certain diseases are recognized as hereditary. These, if appearing regularly in the same manner in the same family, may be due to 1 factor, as for instance amaurotic idiocy. About 60 abnormalities (diseases) are listed as hereditary.—The advance of investigations during the last 10–15 years is noted. Experiments of Goldmann, Arnold and others regarding cell functions, cell fermentations, permeability of cell walls, excretion of cells, degeneration of cells, etc., are discussed. Degeneration giving rise to organic nerve diseases has been but little studied. The accumulation of waste in the cells and the increased function of the cell is very dangerous for the cell. Diseased conditions might also be caused by absence of cell functions.—Dietetics are corrective methods against such conditions.—The theory of determination of hereditary influences in the cell is next discussed, including nuclear and cytoplasmic inheritance. Small differences, enlargements, etc., in localization may appear in the different members of a family.—The author believes that the possibility of small changes in the egg plasm is greater than changes in chromosomes during nuclear division, and that "localisation" influenced by plasma, as the seat of the material, is more logical than that it should be influenced by nuclear chromosomes.—The constitution then has its origin in the germ and is a problem of heredity.—*Peter J. Klaphaak.*

6317. Benedict, R. C. **Artificial varieties under natural conditions.** Jour. Heredity **14**: 115–116. *1 fig.* 1923.—A horticultural variety (Whitmani) of the Boston fern has grown wild in Florida for 12 years, maintaining its typical form with no greater change than would be expected under unfavorable greenhouse conditions. The original plant has spread until about 2 square rods of ground are irregularly covered.—*R. C. Cook.*

6318. Chevalier, A. **Le cotonnier Pima.** [Pima Cotton.] [Rev. of: Kearney, Thomas H. **Heritable variations in an apparently uniform variety of cotton.** Jour. Agric. Res. **21**: 227–242. 1921.] Rev. Bot. Appl. et Agric. Coloniale **2**: 24, 25. 1922.

6319. Clark, Hubert L. **The distribution and derivation of some New England echinoderms.** Amer. Nat. **57**: 229–237. 1923.—There are sufficient data on the distribution of 40 of the 46 species of echinoderms known to occur on the New England coast to permit an interpretation of their derivation. Thirty-two of these are of northern origin and 8 of southern origin. The data on the distribution of these echinoderms indicate that: (1) they have a northern origin with few exceptions; (2) they have little tendency to form endemic species or varieties on these coasts; (3) they are representatives of genera that in warmer seas become differentiated into numerous constant forms. Some details are given of the distribution and place of origin of *Strongylocentrotus dröbachiensis, Crossaster papposus, Ophiopholis aculeata, Arbacia punctulata, Asterias forbesi, A. vulgaris, Leptosynapta inhaerens.*—*Geo. T. Hargitt.*

6320. Conklin, E. G. **Problems of organic adaptation.** Rice Inst. Pamphlet **8**: 299–380. 1921.—The 3 lectures which constituted this course at the Rice Institute are entitled respectively: fitness in the living world; the mechanism of adaptation; mechanism, vitalism, and teleology.—*J. R. Schramm.*

6321. Davis, B. M. **Species, pure and impure.** Science **55**: 107–114. 1922.—The conception of species as modified by extended knowledge is discussed. The author states that chiefly as the result of genetical studies of the near present there are 2 conceptions of species: (1) The pure species as conceived by Darwin and others, which, as expressed in the

terminology of the modern geneticist, is homozygous for all genes responsible for the species characters other than those of sex or sex-linked characters. For the latter the germplasm is heterozygous in either the ♂ or ♀ individual, at least where animal forms are under consideration. The author does not agree with Lotsy's definition: "A species is the total of all individuals of the same hereditary composition, forming but one kind of reproductive cell," since it calls for the absolutely pure race, almost an abstraction in higher animals and plants. (2) The impure species, the germplasm of which in the diploid condition carries different sets of genes affecting characters other than those associated with sex, and which therefore is heterozygous. It is therefore clearly hybrid in its genetical constitution, but frequently shows little or no evidence of segregation, thus breeding true or nearly true to type. This may be due to: (a) the death, sterility, or the failure of maturation of classes of gametes, eliminating the possibilities of development of whole groups of segregates; (b) the failure of gametes to produce in conjugation viable zygotes due to diverse conditions, among them the presence of lethal factors.—Thus are left favored gametes, which carry between them those genes which in combination reproduce the impure heterozygous germinal constitution of the parent stock.—As an example of an impure species the author refers to *Oenothera Lamarckiana* used by de Vries in his explanation of the mutation theory and to *O. Neo-Lamarckiana*, an impure synthetic species selected by selfed seed for 6 generations by the author from hybrid ancestry, and which agrees in all essential characteristics with *O. Lamarckiana*. The author states that most species of *Oenothera* are impure. One, however, a line of *O. franciscana*, he regards as most nearly a pure *Oenothera* species. It gave 87.3 per cent of germination. Among 1,425 plants (52 of which died as seedlings) no exceptions to type were present, and crosses with *franciscana* pollen showed that the F_1's were uniform, indicating that pollen was genetically alike. Cytological studies showed a regular pairing at meiosis.—The author treats in condensed form the use of the theory of lethals in *Oenothera* and *Drosophila* hypotheses, showing the similarity of one to the other. He then discusses the appearance among certain plants of: self-sterility, e.g., chicory; free or open cross-pollination, e.g., corn; and consequences of inbreeding, e.g., *Crepis*.—Another type of impure species is mentioned as existing only in certain types or groups of plants, e.g., violets, blackberries, tree fruits, etc., perpetuated by vegetative means.—The author concludes with the question as to whether the impure species should be grouped for convenience as collective species.—*Peter J. Klaphaak.*

6322. Duck, Russel W. **Colors of short-horn cattle.** Jour. of Heredity **14**: 65–75. *6 fig.* 1923.—Tracing color-inheritance by means of the data contained in the Herd-books of the Short-Horn Breeder's Association brings in many chances of error, because of inaccurate registration. In tracing 11,685 matings, and corresponding with breeders in doubtful cases, it is concluded that red is the basic color in Short-horns, and that white is "due to the absence of any color factor." Red-and-White represents the red factor in the heterozygous condition, in the absence of the roan "extension factor." Roan is considered to be due to the presence of an extension factor when the factor for red is heterozygous. A table is included giving the data obtained in tracing these matings.—*R. C. Cook.*

6323. East, E. M. **Weatherwax on maize endosperm.** [Rev. of: Weatherwax, Paul. **A rare carbohydrate in waxy maize.** Genetics **7**: 568–572. 1922 (see Bot. Absts. 12, Entry 3281).] Science **57**: 416–418. 1923. [See also Bot. Absts. **12**, Entry 6337.]

6324. Ellinger, T. **Metoder til Analys af Stamtavler med Hensyn til Indavl og Slaegtskab. [Methods for analyses of genealogies in respect of inbreeding and relationship.]** Nordisk Jordbrugsforskning **1921**: 49–66. *3 fig.* 1921.—The author discusses Pearl's coefficients of inbreeding, relationship and partial inbreeding indices and suggests certain modifications for the purpose of bringing all measurements of inbreeding and relationship on the same scale. He points out the desirability of coefficients of total inbreeding and relationship and a total relationship inbreeding index, the last to measure the proportion of the inbreeding that is due to relationship between the sire and dam.—*Sewall Wright.*

6325. Engledow, F. L. **The inheritance of glume length in a wheat cross (cont.).** Jour. Genetics 13: 79–100. 1923.—Previous work carried through the F_3 generation [see Bot. Absts. 8, Entry 253] was continued through the 2 succeeding generations but only upon glume length of the Polish wheat of the Polish-Kubanka cross. The material and methods were scrutinized with great care but nothing was found to warrant a conclusion different than the one previously announced,—that the extracted Polish glume length in all cases was approximately 20 per cent shorter than the parental glume length. Further studies in the inheritance of solidness of straw did not show that these results had to do with "shift" in mean glume length.—Although double fertilization occurs in wheat no evidence could be found of the presence of more than 1 endosperm type in the F_2 endosperms borne by the F_1 plant. It is presumed that the endosperm is maternal in its nature.—An attempt was made to explain the nature of "shift" in glume length by the multiple factor hypothesis but in this cross this was found impossible although it is still a matter of uncertainty whether the phenomenon of "shift" is distinct from multiple factor action.—*L. R. Waldron.*

6326. Ernst, Alfred. **Chromosomenzahl und Rassenbildung.** [Chromosome number and species formation.] Vierteljahrsschr. Naturf. Ges. Zurich 67: 75–108. 1922.—A summary and discussion are presented of the literature on the origin of new types of plants differing in chromosome number from the stock from which they came as a result of: (1) mutation, (2) action of outer influences, (3) hybridization between forms with different chromosome numbers.—*Margaret C. Mann.*

6327. Etheridge, W. C., W. H. Eyster, and L. J. Stadler. **A genetic analysis of maize.** Missouri Agric. Exp. Sta. Bull. 197. *69 p.* 1922.—Brief notes are given on the inheritance of zigzag culms and scarred endosperm in maize, and also on the relative frequency of crossing-over in megasporogenesis and microsporogenesis. Papers dealing with these several subjects in detail have appeared elsewhere [see Bot. Absts. 12, Entries 1783, 3167, 3168].—*J. H. Kempton.*

6328. Fairchild, Milton. **Pure science work in higher eugenics.** 2nd Internat' Congress Eugenics. Vol. II. Eugenics in race and state. *358–360.* Williams and Wilkins Co.: Baltimore, 1923.—Educationists throughout the country are looking to students of science, having to do with human life, for "adequate and reliable generalizations for use in deciding what education ought to be given boys and girls as a preparation for their lives as fathers and mothers in the homes of the nation."—*Charlotte Elliott.*

6329. Gowen, J. W., and M. R. Covell. **Studies in milk secretion. XII. Transmitting qualities of Holstein-Friesian sires for milk yield, butter fat percentage and butter fat.** Maine Agric. Exp. Sta. Bull. 301. *253–308. 2 fig.* 1921.—A study is reported of Holstein-Friesian advanced registry sires to determine their ability to transmit milk yield, butter fat percentage, and butter fat to their offspring. One hundred and eleven sires were found to have had 2 or more tested daughters from tested dams, all of which had met advanced registry requirements. The transmitting ability of the bulls is measured by the increase or decrease shown by the daughters (after making suitable age corrections). The names and numbers of the sires, the number of daughter-dam pairs, the net difference, and a condensed record (by quartiles), showing the relative level within the breed of the individual dams and daughters, is presented for each of the characters studied. It is shown that only 11 of the sires increased their daughter's yield 2 times its probable error and only 3 lowered their yield a similar amount. No significant differences in inbreeding, relationship, or in the ancestry of these animals could be found. Essentially similar results were found for butter fat percentage and production. A comparison of transmitting ability of sires and sons gave no clear evidences of heredity. A study of 2 major groups of sires, those with daughters superior to their dams in both milk yield and butter fat percentage, and those inferior in both respects yielded no significant differences in inbreeding, relationship of sire and dam, or ancestry. A comparison of both groups with random sires, none of whose daughters had met advanced registry requirements, again brought out no important differences in ancestry. —*Sewall Wright.*

6330. Guyer, M. F. **Internal secretions and acquired characters.** [Rev. of: Cunningham, J. T. **Hormones and heredity.** *xx* + *246 p.* Macmillan Co.: New York, 1921.] Jour. Heredity 14: 136–138. 1923.—The reviewer points out that Cunningham uses the term "hormones" "in a much wider sense than is warranted by our actual knowledge."—*R. C. Cook.*

6331. Harris, J. Arthur, and H. R. Lewis. **The correlation between the time of beginning and the time of cessation of laying in the first and second laying year in the domestic fowl.** Genetics 8: 37–74. *10 diagr.* 1923.—Records on 443 White Leghorns made during their first 2 years at the Vineland Contest are reported. Correlation coefficients are reported as follows: (1) time of beginning laying on the 2 years, $r = .2295$; (2) time of cessation of laying on the 2 years, $r = .5020$; (3) time of beginning to lay the 1st year and cessation of laying the 1st year, $r = .2439$; (4) time of beginning to lay the 2nd year and time of cessation of laying the 2nd year, $r = .3969$; (5) the time of cessation of laying the 1st year and beginning to lay the 2nd year, $r = .5007$; and (6) time of beginning to lay the 1st year and ceasing to lay the 2nd year, $r = .1561$. The correlation factors indicate the existence of a positive relationship in the 6 groupings made.—*F. A. Hays.*

6332. Heribert-Nilsson, Nils. **Kritische Betrachtungen und faktorielle Erklärung der Laeta-velutina-Spaltung bei Oenothera. [Critical considerations and factorial interpretation of the laeta-velutina segregation in Oenothera.]** Hereditas 1: 312–342. *3 fig.* 1920.—A study of the literature regarding the *laeta-velutina* segregation (or similar segregations) in *Oenothera* showed that de Vries obtained from the *velutina* ♀ × *laeta* ♂ crosses, only *laeta*. Renner, however, obtained from the same cross mainly *O. Lamarckiana* and only a small number of *O. laeta*. The author repeating the cross found neither *laeta* nor *Lamarckiana* alone, but mainly a 3rd distinctive type. He believes that both de Vries and Renner obtained this same type, but that both classified it according to specific characters which proved their theories. The new type was *Lamarckiana*-like in the vegetative parts and *biennis*-like in the floral parts. The author calls this type *ambigua*. *Ambigua* buds are smaller and barrel-shaped in contrast with *Lamarckiana* buds, which are large and cone-shaped. They are similar to *O. biennis* buds, but larger and coarser and colored reddish-brown. The flowers vary in size between those of F_1 *laeta* × *biennis*. The flower shape is most like *biennis*, the style is short, the floral internodes (inflorescence) are shorter, and the fruits are reddish-striped and more horizontal than in *Lamarckiana*. The vegetative parts are like *Lamarckiana*, the branching is more erect. About ¼ of the F_1 of the *ambigua* type were very much like *Lamarckiana*, with only a slight difference in flower size. Some have very large flowers and a very long pistil, others have shorter flowers and shorter pistils which do not reach above the stamens.—Besides plants of the *ambigua* type, *laeta* plants were obtained by the author in his cross. In all crosses of this type *laeta* appears in very small numbers.—de Vries finding "only *laeta*" must have classified *ambigua* and *Lamarckiana* as modified *laeta*, because he mentions that "some *laeta* were *Lamarckiana*-like." Renner on the other hand, finding mostly *Lamarckiana*, mentions difference in flower size, grouping therefore *ambigua* under *Lamarckiana*.—The author regards flower size as an important factor, which up to the present has usually been left out of consideration. In the cross *biennis* × *Lamarckiana* small flower-size is dominant over large. *O. biennis* contains therefore the factor *B* (small flower size). The F_1 is then small-flowered independent of type. F_2 as found by both Renner and the author is mainly small-flowered, in 1 F_2, 33 small-flowered, 14 large-flowered were obtained.—Besides flower size, *B* influences also type of branching, length of internodes of inflorescence, direction of buds and fruits, and form of buds and flowers. It is thus a complex factor. Renner's "albicans complex" influencing only white veins has no meaning, as *O. Lamarckiana* has white veins. It does not influence other characters. *r* in *Lamarckiana* (factor for white veins) as opposite to *R* (red veins) is therefore the same as the "albican complex."—The author, not agreeing with Renners homozygotic theory (in which the homozygotes are lethal), accepts the presence of 2 factors, *L* and *V*, which show strong repulsion for one another, so that no "positive" homozygotes are formed. *Lamarckiana* is then *LlVv*, as only the gametes *Lv* and *lV* are formed; *biennis* is *llvv*. *O. biennis* × *Lamarckiana* gives

then the following combinations: $lv \times Lv$ and $lv \times lV$ or *Llvv* and *llVv*, which, being heterozygotic, are viable. The acceptance of the factor *B* in this scheme as belonging to *biennis* explains the appearance of *ambigua* in the cross *laeta-velutina*. The author claims that his explanation by factorial (Mendelian) inheritance does away with the de Vriesian hypothesis of 2 lethal factors and a special mutation process.—The *blandina* (*velutina*) and *simplex* (*laeta*) types obtained by de Vries from selfed *Lamarckiana* can be explained by the author's hypothesis of 2 factors, *L* and *V*, which may sometimes combine (about once in 100,000 times), but which are highly repulsive to one another. The gametes are formed in the following ratio: 1 *LV*: 100,000 *Lv*: 100,000 *lV*: 1 *lv*. All positive combinations ($\frac{1}{2}$ of all combinations), i.e., those containing either *LL* or *VV* or both, are lethal; the negative ones are vital.—The author states finally that most if not all of the differences in observations on *Oenothera* phenomena are due to the terminology used. Mutation is complicated segregation (repulsion, homozygote elimination, heterogamy); complex inheritance is pleiotrophy; nuclear chimaera means the formation of pure gametes, and abnormal ratios are due to certation, i.e., a different power of growth of genotypically different pollen tubes. An English summary concludes the paper.—*Peter J. Klaphaak.*

6333. Hertwig, Paula. **Der bisherige Stand der erbanalytischen Untersuchungen an Hühnern.** [The present status of genetic investigations in poultry.] Zeitschr. Indukt. Abstamm.- u. Vererb. 30: 183–254. 1923.—This paper furnishes a very complete review of work done on the many phases of poultry breeding. Most of the important genetic work on this problem has been presented in comprehensive form. The paper furnishes a valuable summary and reference list.—*F. A. Hays.*

6334. Hunt, H. R. **The Allegheny College birth rate.** Jour. Heredity 14: 50–60, 139–144. *1 fig.* 1923.—In this statistical study of the birth rate of the graduates of Allegheny College it develops that "the birth and marriage rates have remained fairly constant for graduates of Allegheny College (classes of 1870–1899), but the group has probably fallen somewhat short of producing enough children to replace itself."—*R. C. Cook.*

6335. Johnson, Roswell H. **Mate selection.** 2nd Internat. Congress Eugenics. Vol. I. Eugenics, genetics, and the family. *416–425.* Williams & Wilkins Co.: Baltimore, 1923.—Assortive mating in man accentuates attributes, tending to confine high attainment to certain strains, and to restrict defects to other strains. Mate selection may be influenced by the possession of a particular quality, in which case the intensity of that quality among descendants may eventually come to lie outside the normal range of variation of the race. Matings may be the result of preference, though the precise reason for the choice may or may not be recognized by the suitor. The range of effective mating can be restricted by differential death rates of the sexes, geographical and social segregation, celibacy, sterility, and delayed marriage.—The importance of beauty is frequently overemphasized. Stability, persistence, judgment, etc., in women are likely to be undervalued by men. Public record of the results of mental tests is desirable as an aid to intelligent choices of mates. The racial usefulness of superior persons consists largely in having offspring, which will pass on their excellent qualities to posterity. Superior women should not persistently insist on excessively high qualifications in a mate, for such an attitude may entirely prevent their marrying. Sterility resulting from venereal disease is probably on the whole eugenic, because of its greater frequency among mentally inferior persons. Laws restricting the diffusion of the knowledge of birth control are undesirable, for such control should be applied on a eugenic basis.—*H. R. Hunt.*

6336. Kahn, E. [German rev. of: Fuchs, W. **Psychiatrischerbbiologische Korrelationsphänomenologie.** (Study of psychiatric-genetic correlation phenomena.) Zeitschr. f. Ges. Neurol. u. Psychiatrie 69: 158–168. 1921.]—Zeitschr Indukt. Abstamm.- u. Vererb. 30: 139. 1922.

6337. Kempton, J. H. **Erythrodextrin in maize.** [Rev. of: Weatherwax, Paul. **A rare carbohydrate in waxy maize.** Genetics 7: 568–572. 1922 (see Bot. Absts. 12, Entry 3281.] Science 57: 556–557. 1923. [See also Bot. Absts. 12, Entry 6323.]

6338. Knopf, S. A. **Eugenics in its relation to the tuberculosis problem.** 2nd Internat. Congress Eugenics. Vol. II. Eugenics in race and state. *298–308.* Williams & Wilkins Co.: Baltimore, 1923.—While education and sanitation have done much to lower the tuberculosis death rate from environmental causes, thousands of tuberculous individuals still die annually in spite of treatment, education, etc.—Direct bacillary transmission of tuberculosis occurs so rarely that the disease is no longer considered hereditary. Tuberculous predisposition may, however, be inherited due primarily, the writer thinks, to the mingling of the blood in the maternal and foetal circulation.—Any inherited predisposition becomes manifest and mortality is highest between the ages of 18 and 35. Since this is also the period when marriages are most frequently contracted it is at this period that the importance of eugenics in its relation to the tuberculosis problem should be considered.—When 2 individuals whose physique indicates a tuberculous tendency marry their offspring rarely escape the disease; when the mother only is predisposed the children may or may not be weak and predisposed. The writer recommends obligatory examination of individuals wishing to marry, instruction in parenthood, and birth control clinics such as are held in Holland. He believes that if the tuberculosis problem in the U. S. A. were attacked from the eugenic as well as from the environmental side there would be hope of the absolute eradication of the disease, but that without judicious scientific birth control tuberculosis will not be controlled.—*Charlotte Elliott.*

6339. Lidbetter, E. L. **Pedigrees of pauper stocks.** 2nd Internat. Congress Eugenics. Vol. I. Eugenics, genetics and the family. *391–397.* Williams & Wilkins Co.: Baltimore, 1923.—There is, in the general population of England, a well-defined pauper group characterized by varying degrees of mental disorder, low grade incompetence, and lack of morality. This pauper group shows a remarkable degree of assortive mating which is fostered by the Poor Law system.—*H. R. Hunt.*

6340. Lindstrom, E. W. **Hereditable characters of maize XIII. Endosperm defects—sweet defective and flint defective.** Jour. Heredity 14: 127–135. *5 fig.* 1923.—Two distinct types of heritable endosperm defects of maize were isolated by inbreeding in Golden Bantam sweet corn and in Yellow Flint corn. Data for 3 generations prove that the sweet-defective kernels of the Golden Bantam variety are excessive in inheritance and are conditioned by a simple, Mendelian factor. A new mutant type of endosperm defect arose during the progress of the experiment. The endosperm defect discovered in the flint corn was also recessive and due to a single factor. This factor is completely linked with white or albino seedlings. —*E. W. Lindstrom.*

6341. Lippincott, W. A. **Genes for the extension of black pigment in the chicken.** Amer. Nat. 57: 284–287. 1923.—Crosses were made to discover whether Dunn's E^m factor for the extension of melanic pigment in poultry is identical with the E factor reported by Lippincott in Anadalusians. A blue-splashed Anadalusian male was mated with Light Brahma, Buff Orpington, Rhode Island Red, and Lakenvelder females. All offspring were blue. This fact indicates that factors E^m and E are not identical and that the blue-splashed Anadalusian ♂ carried factor E^m while the females carried factor E.—*F. A. Hays.*

6342. Lotsy, J. P. [Dutch rev. of: (1) Åkerman, Å. **Untersuchungen über Bastarde zwischen Epilobium hirsutum und E. montanum.** (**Investigations on hybrids between Epilobium hirsutum and E. montanum.**) Hereditas 2: 99–112. 1921 (see Bot. Absts. 9, Entry 1290). (2) Rasmuson, H. **Beiträge zu einer genetischen Analyse zweier Godetia-Arten und ihrer Bastarde.** (**Contribution to a genetic analysis of two Godetia species and their hybrids.**) Hereditas 2: 143–289. *1 pl., 29 fig.* 1921 (see Bot. Absts. 9, Entry 1366).] Genetica 5: 79–80. 1923.

6343. Lotsy, J. P. [Dutch rev. of: Beebe, William. **A monograph of the pheasants.** Vol. 2. *269 p., 48 pl. (24 col.), 4 fig., 5 maps.* H. F. and G. Witherby: London, 1921.] Genetica **5**: 83–87. 1923.

6344. Lotsy, J. P. [Dutch rev. of: Beebe, William. **A monograph of the pheasants.** Vol. 3. *204 p., 45 pl. (24 col.), 4 maps.* H. F. and G. Witherby: London, 1921.] Genetica **5**: 88. 1923.

6345. Mandekić, V. **Die Vererbung einiger Eigenschaften bei Mais.** [The genetics of several maize characters.] Zeitschr. Pflanzenzucht. **9**: 23–34. *8 fig.* 1923.—Comparisons of the progenies from different selections of Croatian Round corn showed length of ear to be inherited, conforming well with Galton's law. Correlation was observed in the material studied between number of rows and length and circumference of ear, yield and length of ear and number of rows, length of ear and circumference and number of rows, circumferences of ear and of cob, and number of rows and circumferences of ear and of cob. The use of a pure line is considered essential in studying inheritance of characters in corn.—*H. M. Steece.*

6346. Mangelsdorf, P. C. **The inheritance of defective seeds in maize.** Jour. Heredity **14**: 119–125. *5 fig.* 1923.—The extensive inbreeding of corn for the purpose of isolating pure lines has brought to light a large number of defective seeds in which the endosperm is partially or completely aborted or in which the seed fails to go into the resting stage. These characters have been found in more than 30 American and several foreign varieties. Breeding experiments show that there are many distinct genetic types of this abnormality.—*P. C. Mangelsdorf.*

6347. Mjøen, Jon A. **Harmonic and disharmonic race crossings.** 2nd Internat Congress Eugenics. Vol. II. Eugenics in race and state. *41–61.* Williams & Wilkins Co.: Baltimore, 1923.—The writer cites examples to show that crossings between widely different races such as the Lapps and Norwegians may lower both the physical and mental level. From results of crossings between the races of rabbits he concludes that there are many striking analogies between the defects resulting from race crossing among humans and those resulting from race crossings in animals. While the author does not wish to draw conclusions from one race crossing he states that experience to date points decidedly in one direction and that until we have more definite knowledge of the effects of race crossings it would be wise to avoid crossings between widely different races.—*Charlotte Elliott.*

6348. Moir, W. W. G. **Clonal type selection in sugar cane.** Facts about Sugar **16**: 133–135, 172–173, 232–233. 1923.—Type mutations, which may be isolated in pure lines, exist in sugar cane. The behavior of the progeny is the basis for the study of these type selections. The 1st field selection is of primary importance as this isolates the pure lines. Type selection of cane has given quick and surprising results in Hawaii.—*C. W. Edgerton.*

6349. Nagai, Isaburo, and Shuichi Saito. **Linked factors in soy-bean.** Japanese Jour. Bot. **1**: 121–136. 1923.—In some genetic studies on soybeans there appeared a mutant which lacked pubescence. This character was found to be dominant over the presence of pubescence. The factor for glabrousness, *P*, was linked to the factor *M*, for mottling in the seed coat, with a percentage of crossing over of 18.12. Glabrousness is accompanied by lessened vigor of growth and reduced assimilative activity.—The following factors for seed coat colors and patterns have been studied: *C*, responsible for the formation of the chromogenic substance in the seed coat; *c*, same action as *C*, but to a slight extent. *O*, responsible for converting the chromogenic substance to brown pigments; *o*, same action as *O*, but to a deeper brown. *R*, responsible for converting the chromogenic substance to black pigment (anthocyanin); *r*, no effect. *M*, responsible for the development of the black pigment in a mottled pattern; *m*, no effect. *H*, responsible for fully inhibiting the formation of the chromogenic substance in the seed coat; *h*, no effect. *I*, responsible for partially inhibiting

the formation of the chromogenic substance; *i*, no effect. *K*, responsible for partially inhibiting the pigment, giving rise to the "patched" pattern; *k*, no effect. *G*, responsible for the formation of chlorophyll pigments in the seed coat; *g*, responsible for the formation of yellow pigments in the seed coat.—Certain factor interactions were noted. Thus, *R* produces a full black seed coat in the presence of *C*, but only to a certain extent with *c*; likewise, *M* gives a full expression of black mottling with *C*, but this action occurs only to a slight extent with *c*.—*C. M. Woodworth.*

6350. Nohara, Sigeroku. **Genetical studies on Spinacia.** Japanese Jour. Bot. 1: 111–120. 1923.—Crosses were made between *Spinacia oleracia* Mill. and *S. spinosa*. In the former, the persistent bractlets covering the fruits are smooth; in the latter, horned. Horned fruits and smooth fruits were found to be simple allelomorphs, the horned character being dominant, and a 3:1 ratio being obtained in F_2.—The sex ratio of the plants used appproached closely 1:1. The author inclines to the belief that *S. spinosa* is the species-type and *S. oleracea*, its variety.—*C. M. Woodworth.*

6351. Ostenfeld, C. H. **Experimentelle Undersøgelser over Artsdannelsen hos Slaegten Høgeurt.** [**Experiments with creation of species in Hieracium.**] Nat. Verden 5: 400–417. *Fig. 1–4.* 1921.—In 1900 a multitude of species and forms were described and it was shown by Schultz that they might be hybridized, and by Mendel that the hybrids were of constant type (did not "mendelate"). Directed by the demonstration of agamy in *Antennaria* by Juel and in *Taraxacum* by Raunkiaer, the author "agamised" the flowers of several forms of *Hieracium* and found the seed developing without fertilization, giving a progeny identical with the mother plant. The 3 species of the subgenus *Stenotheca* investigated do not develop agamic seed, and at least *H. venosum* develops the oocyte normally. Of 70 species of *Archhieracium* all but a few were apogamic, and the oocyte had the double number of chromosomes. Of *Pilosella* some species are normal, others develop agamic seed and have an abnormal oocyte. *H. excellens*, the anthers of which are sterile, develops agamic seed, and such is also the case in *H. aurantiacum* following agamisation. But if *H. excellens* is fertilized with pollen from *H. aurantiacum* the F_1 shows some individuals identical with the mother as well as several types of hybrids. In F_2 each of these types breeds true, though the occurrence of sterile hybrids is frequently noted. In *H. rigidum*, an agamic and constant species, 2 new types have appeared, 1 rather weak, the other stout and fertile, which may be termed apogamic mutations. In both subspecies hybridization is the original cause of the polymorphism, while the apogamy will secure the constancy of the forms.—*Ernst Gram.*

6352. Pollock, Horatio M. **Eugenics as a factor in the prevention of mental disease.** 2nd Internat. Congress Eugenics. Vol. II. Eugenics in race and state. *322–326.* Williams & Wilkins Co.: Baltimore. 1923.—Mental disease in the U. S. A. is discussed as regards cost and loss to the nation, rate of increase, inheritance, and measures for checking its increase. Much evidence exists that Mendelian inheritance of neuropathic constitution occurs, but more comprehensive studies are necessary. Mental disease may occur in almost any type of intellectual or temperamental make-up, as clearly shown during the World War. Psychopathic personalities give way to the common stresses of life; stronger personalities yield only to extraordinary mental strain. It is evident, therefore, that the whole etiology of a case of mental disease must be carefully studied before the related family stock can be safely discredited.—The data collected by the New York State Hospital Commission seem to indicate that slightly more than ½ of ascertained cases have no discoverable hereditary basis. More thorough inquiries might increase the proportion of patients with unfavorable family history, but the significance of the history in relation to the family stock is open to question in many cases.—In 1920, data from the Commissioners' hospitals showed that of 1st admissions 61 per cent of ascertained cases were temperamentally normal and 88 per cent were rated as intellectually abnormal.—The absence of marked abnormalities in individuals prior to the onset of the psychosis cannot be construed as conclusive evidence that there are no hereditary defects in the make-up, neither can the development of the psychosis be taken

as proof of a defective constitution. All the facts in connection with the onset of the mental disorder and previous reactions must be brought together before the constitutional make-up of the patient can be positively determined.—Notwithstanding these and many other complications, there is abundant evidence that mental disorders occur much more frequently in some family stocks than in others, and that prolonged inbreeding of degenerate stocks produces disastrous results.—Three lines of action are suggested: (1) environmental stresses may be lessened and natural resistance strengthened; (2) procreation of defective stock may be checked; (3) procreation of normal stock may be increased. Segregation of the insane is fairly complete, but as only about ¼ of the 1st admissions are under 30 years of age on admission, its value in preventing procreation in this group is not as great as would appear when only the number of patients under treatment is considered.—Something can be done to lessen reproduction among the unfit by enlightening public sentiment and by better marriage laws. Marriage of persons with marked intellectual or temperamental abnormalities should be entirely prohibited.—*Horatio M. Pollock.*

6353. Rabaud, Etienne. **Developpement compare des produits successifs d'une meme couple.** [Comparative development of successive progeny of the same parents.] 2nd Internat. Congress Eugenics. Vol. I. Eugenics, genetics and the family. *303–305.* Williams & Wilkins Co.: Baltimore, 1923.—The popular idea that the 1st-born is less well endowed than the other children, rests upon prejudice and inaccurate observation. There are no satisfactory human statistics on this question. The writer worked on mice. The results did not, in general, confirm the popular belief. Several types of crosses were used, the ages and relationships between the parents varying. Each resulting litter was weighed at birth, then regularly for 4 consecutive weeks, and finally at the end of the 3rd month. Insignificant differences existed among the litters. In a general way, the growth of the descendants of a pair, under normal conditions of nutrition, depends upon the constitution of the pair.—*H. R. Hunt.*

6354. Rant, A. **Einige Beobachtungen bei Clitoria ternatea L.** [Some observations on Clitoria ternatea L.] Bull. Jard. Bot. Buitenzorg III, 4: 241–246. *Pl. 11, 12.* 1922.—A preliminary report is presented on the crossing of different forms, white and blue, zygomorphic and peloric, of *Clitoria ternatea.* The author found the blue color and the peloric form to be dominant characters. In the F_2 generation of a cross between plants with dark blue flowers and strains with white flowers, plants with violet flowers appeared. There is also a note on a bud-variation of *C. ternatea* and on the influence of altitude on habit, which is climbing at low, and shrubby at higher altitudes.—*Alfred Rehder.*

6355. Rau, Venkata. **Inheritance of some morphological characters in Crepis capillaris.** Univ. California Publ. Agric. Sci. 2: 217–242. *2 pl.* 1923.—The hereditability of the 3 characters, length of leaf, number of lobes per leaf, and diameter of flower heads, has been studied. Strains showing marked differences in these characters were found to breed true. Accurate classification of F_2 plants from the cross long × short leaf was difficult because of somatic variability of this character. The inheritance of leaf lobes depended upon the action of 4 sets of genes, which determined respectively (a) the presence or absence of lobes, (b) depth of incisions, (c) number of lobes per leaf, and (d) the development of secondary lobules of the midrib of the leaf into full sized lobes. Crosses involving the number of lobes per leaf indicated that multiple factors were operating as well as in the inheritance for size of flower head. It was found that terminal flower heads of a cyme were slightly larger than later ones and that the 1st heads of flowers were usually the larger. Very little correlation was found between number of lobes and length of leaf.—*J. L. Collins.*

6356. Reese. H. H. **Horse-breeding suggestions for farmers.** U. S. Dept. Agric. Farmers' Bull. 803. *20 p., 10 fig.* 1923.

6357. Roemer. **Die Züchtung der Lupinen.** [The breeding of lupines.] Mitteil. Deutsch. Landw. Ges. 38: 134. 1923.—In this brief report of an address before a section of

the German Agricultural Society, it is reported that the blue lupine (*L. angustifolius ?*) is self-fertile while the yellow (*L. luteus*) is self-sterile. Plants from early seeding remain shorter stemmed and bloom and ripen earlier than those from later seeding. The rough hairy lupine (*L. hirsutus ?*) is low in alkaloid. Attempts to combine valuable qualities of different species by crossing have failed. Improvement must be by selection of variations.—*A. J. Pieters.*

6358. Seelhorst, von. **Die am landwirtschaftlichen Institut der Universität Göttingen bislang geleistete Arbeit zur Förderung und Pflege landwirtschaftlicher Pflanzenzucht. [On the work thus far accomplished by the Agricultural Institute of the University of Göttingen for promotion and fostering of agricultural plant breeding.]** Beitr. Pflanzenzucht **5**: 9–26. *14 fig.* 1922. (Discussion *p. 26–29.*)—This general discussion of the work at this institute states some of the more important accomplishments. The 1st director, Drechsler, began breeding Göttinger rye in 1879, Göttinger oats in 1880, and the bearded Square head wheat in 1885. Cultural and breeding methods are described, the latter consisting at first of head or panicle selection year after year in the same line, and later of pedigree breeding from new selections in the original lines. Publications of investigations in plant physiology at the institute are listed and some of the results of more general interest are briefly outlined.—*C. E. Leighty.*

6359. Siemens. [German rev. of: Meirowsky und Bruck. **Über die Vererbung und Ätiologie der Muttermäler. (On the heredity and etiology of birth marks and moles.)** Münchner Med. Wochenschr. **68**: 1048. 1921.] Arch. Rass.- u. Ges. Biol. **14**: 449. 1923.

6360. Siemens. [German rev. of: Siemens. **Über rezessiv-geschlechtsgebundene Vererbung bei Hautkrankheiten. (Recessive sex-linked inheritance in the skin diseases.)** Arch. Dermatol. **136**: 69–88. 1921.] Arch. Rass.- u. Ges. Biol. **14**: 442–443. 1923.

6361. Siemens. [German rev. of: Weinberg. **Das Geschlechtsverhältnis bei Basedow und seine Ursachen. (The sex ratio in Basedow and its origin.)** Münchner Med. Wochenschr. **68**: 1157. 1921.] Arch. Rass.- u. Ges. Biol. **14**: 449. 1923.

6362. Siemens. [German rev. of: Weinberg. **Zur Lehre vom multiplen Allelomorphismus. (Our knowledge of multiple allelomorphism.)** Münchner Med. Wochenschr. **68**: 950. 1921.] Arch. Rass.- u. Ges Biol. **14**: 448–449. 1923.

6363. Sumner, F. B. **Some facts relevant to a discussion of the origin and inheritance of specific characters.** Amer. Nat. **57**: 238–254. 1923.—Characters separating subspecies (of *Peromyscus*) are genetical [see Bot. Absts. 12, Entry 2452]. Correlations are to be found between climatic environment and certain physical characters, notably between humidity and pigmentation. Increased humidity may favor chemical processes responsible for pigmentation, or modified pigmentation may be induced by environment acting selectively. No certain correlations are evident between physical environment and proportional or absolute size of parts. Any such relationship existing must be obscure and not evidently adaptive. Excluding direct environmental influences and adaptive modifications, sub-specific modifications might be due to (1) differential distribution centers or (2) the result of "orthogenesis." If the orthogenetic hypothesis is invoked, it is necessary to explain many of the variational series in terms of space rather than of time. But either of these explanations, highly speculative as they are, suffices only to account for presence of graded series and not character origins. An orthogenetic explanation involves radical departure from the commonly understood mutation theory.—A positive correlation of about 0.3 is found between shade of pelage and width of tail stripe but no other intra-individual correlation has been found. In hybridization between subspecies of *Peromyscus*, both F_1 and F_2 individuals showed intermediate values for the various subspecific characters. Neither the character complex nor components of the same acted as "simple Mendelian unit characters." Certain conditions render doubtful a tenable explanation on the basis of multiple factors. Finally, the facts do not yet warrant an adequate general hypothesis as to species formation.—*L. R. Waldron.*

6364. Tredgold, A. F. **Educability and inheritance.** 2nd Internat. Congress Eugenics. Vol. II. Eugenics in race and state. *361–372.* Williams & Wilkins Co.: Baltimore, 1923. —The capacity for mental development varies with individuals, social classes, and races, and is determined by innate germinal potentialities which cannot be exceeded. Such differences can be correlated to some extent with brain structure and function. In mental deficiency there is a numerical shortage of cells, an irregularity in their arrangement, and an imperfection of their development; certain layers of cortical fibers which are associative in function undergo a gradual increase with normal mental development. A dimunition of educability is probably due to 1 of 2 causes; to a lack of intellectual stimulus continued for many generations past or to a pathological condition due to an impairment of germinal potentiality by disease, alcoholism, etc. Such defective educability due to germinal impairment is probably unimprovable and is transmissible. There is evidence for the belief that the continued stimulus of education and exercise of the mind generation after generation may augment the germ potentially for mental development and so increase the educability of the race. —*Charlotte Elliott.*

6365. Witte, Hernfrid. **A probable case of "rogue" in red clover.** Hereditas **4**: 55–58. 1923.—Two red clover plants of a type thought to be practically self-fertile were crossed. Of 3 individuals raised as a result of this cross 1 was peculiar in having very narrow leaflets, the width being to the length as 1:7.6 or 1:8 as compared with the ordinary type, in which this ratio is 1:1 or 1:3. The plant proved to be sterile, and Witte suggests that this is a "rogue" in the same sense of Bateson and Pellew.—*A. J. Pieters.*

6366. Wollny. [German rev. of: Meggendorfer, F. **Über die Rolle der Erblichkeit bei der Paralyse. (On the role of heredity in paralysis.)** Zeitschr. Ges. Neurologie u. Psychiatrie **65**: 18–33. 1921.] Arch. Rass.- u. Ges. Biol. **14**: 461. 1923.

6367. Woods, Frederick A. **The conification of social groups. Evidence from New England families.** 2nd Internat. Congress Eugenics. Vol. I. Eugenics, genetics and the family. *312–328.* Williams & Wilkins Co.: Baltimore. 1923.—Social groups sometimes tend to assume the form of a cone; that is, figuratively, some of the group climb upward on the shoulders of others. The development of an aristocracy depends upon the following facts: (1) like tends to mate with like; (2) like begets like. These two forces acting simultaneously lead toward diversification in a population.—The British Dictionary of National Biography shows that the percentage of eminent men coming from the families of craftsmen, artisans, and unskilled laborers has decreased from 11.7 per cent for all time prior to the 19th century, to 4.2 per cent for the 2nd quarter of the 19th century. Thus the gap between the common people and the aristocracy of intellect is widening. In New England conification is actually observed. The great majority of early settlers in Massachusetts Bay were yeomen (artisans, small shopkeepers, etc.), with a sprinkling of gentry (members of gentle English families, the wealthy, learned, etc.). Forty colonial families including more than 3,000 persons have been studied. Differences in wealth and amount of intermarriage between classes were chosen as measures of the extent of conification. Rich men of New England have become progressively richer, by comparison with average men, since the colonial period. The percentage of marriages of the gentry with yeomanry has decreased from about 23 per cent (13 families, marriages prior to 1721), to less than 6 per cent (12 families, marriages since 1821). Assortive mating, heredity, and the possibility of transmitting wealth have thus resulted in social conification within a democracy.—*H. R. Hunt.*

6368. Woodworth, C. M. **Calculation of linkage intensities where duplicate factors are concerned.** Genetics **8**: 106–115. 1923.—This paper concerns the development and application of formulae by means of which from F_2 trihybrid distributions, the degree of linkage can be determined between 2 factors 1 of which is a duplicate, but inherited independently of the 3rd factor involved in the cross.—Application is made to soybean data showing a linkage relation between cotyledon and seed-coat colors. Tables are included giving

theoretical distributions for several assumed gametic series, representing both coupling and repulsion phases, for F_2 in both characters, and also for F_2 in seed-coat color with F_3 in cotyledon color.—*C. M. Woodworth.*

HORTICULTURE

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(See also in this issue Entries 6169, 6191, 6192, 6197, 6200, 6209, 6213, 6313, 6317, 6535, 6572, 6576, 6577, 6578, 6584, 6589, 6597, 6601, 6626, 6638, 6653, 6666, 6689, 6690, 6694)

FRUITS AND GENERAL HORTICULTURE

6369. Anonymous. **The testing of varieties of hardy fruit for commercial purposes.** Jour. Roy. Hort. Soc. 48: 65–67. 1923.—The arrangement between the Royal Horticultural Society and the Ministry of Agriculture for the testing of hardy varieties of fruits including apples, pears, plums, cherries, currants, gooseberries, raspberries, blackberries, strawberries, and nuts is explained.—*J. S. Bailey.*

6370. Arranger, Ch. **L'emballage des fruits de choix.** [Packing choice fruits.] Rev. Hort. 94: 252–254. *Fig. 79–81.* 1922.

6371. Auchinleck, G. G. **The cultivation of limes.** Dept. Agric. Ceylon Bull. 49. *18 p., 2 pl.* 1921.—This is a general consideration of the subject especially in reference to the commercial aspects of the crop in Ceylon.—*E. D. Merrill.*

6372. Auchinleck, G. G. **The west African oil palm and its products.** Dept. Agric. Ceylon Bull. 62. *18 p., 5 pl.* 1923.—This is a general consideration of the oil palm (*Elaeis guineensis*) in reference to its agricultural and commercial aspects. It seems likely that the production and ultization of palm oil and kernel oil will in the future become as highly specialized as rubber or as coconut oil.—*E. D. Merrill.*

6373. Bryce, G., and C. H. Gadd. **Improvement of yield in Hevea by the selection of seed bearers.** Dept. Agric. Ceylon Bull. 55. *42 p., 9 fig.* 1922.—The offspring of a high-yielding mother tree are not all high yielders, but their mean yield is slightly higher than that of trees grown from non-selected seed, thus indicating that the production of a high-yielding strain of *Hevea* would necessitate rigid selection over several generations.—*E. D. Merrill.*

6374. Chasset, L. **Les effets du surgreffage.** [The effects of top grafting.] Rev. Hort. 94: 242. 1922.—Varieties not readily grafted on quince may be made to succeed by double working. Time of maturity or shape of the fruit of the scion probably have no direct relation to these characteristics of the stock.—*E. J. Kraus.*

6375. Chasset, L. **Pincement et non pincement des arbres fruitiers.** [Pinching or non-pinching of fruit trees.] Rev. Hort. 94: 197–198. 1922.—The author states that pinching may be omitted except where necessary to aid in forming the tree, or when the fruit is too densely surrounded by leaves.—*E. J. Kraus.*

6376. Chasset, L. **Poire Duchesse Bererd.** [The D. Bererd pear.] Rev. Hort. 94: 256–257. *1 pl. (col.).* 1922.—Origin and descriptive notes are given.—*E. J. Kraus.*

6377. Crevost, C., et C. Lemarié. **Catalogue des produits de l'Indochine. Groupe III. Matieres grasses-oléagneaux.** [Catalogue of the products of Indo-China. Fats and oils.] Bull. Econ. Indochine 25: 143–158, 325–343, 387–430. *Illus.* 1922.—A general consideration of the native and introduced oil-producing plants in Indo-China. The more important species are illustrated.—*E. D. Merrill.*

6378. Dern. **Auswahl und Beschaffung von brauchbaren Amerikanerreben zu Unterlagshölzern.** [Selection and production of useful American vines for stocks.] Mitteil. Deutsch. Landw. Ges. 38: 274–275. 1923.—The author points out that while the German vine-growing sections are still comparatively free from Phylloxera the difficulty of keeping them so is becoming increasingly great. The good and bad points of some of the more common American stocks at present used in France are brought out.—*A. J. Pieters.*

6379. Hooker, H. D., Jr. **Localization of factors determining fruit bud formation.** Missouri Agric. Exp. Sta. Res. Bull. 47. *19 p.* 1921.—A statistical study of fruit spurs of apple showed an increased tendency toward fruit-bud formation with increased length of spur. More fruit buds were formed on spurs which had grown 3–10 cm. in the previous year than on those which had grown 1–3 cm. Further analysis of data showed a pronounced tendency toward mass action, as far as fruit-bud formation is concerned, by individual trees, scaffold limbs, and branches. From this it would appear that the relation between fruit-bud formation and length of spur is a parallel manifestation of the same influence rather than a cause and effect relationship. This idea is strengthened by data showing that spurs which never blossom alternate in length growth as do blossoming spurs. Chemical analyses of spurs and bark on bearing and non-bearing trees showed increased carbohydrates in the non-bearing trees in both cases. Apparently the conditions in the bearing spurs influence the composition of remote parts of the limb, and the non-bearing spurs. Whether or not remote parts influence the spurs is not yet known. The author concludes that, while the individual spurs may act as units, they may at times be influenced by the performance of other spurs.—*A. M. Burroughs.*

6380. Lesourd, F. **Pincement ou non pincement des arbres.** [Pinching or non-pinching of trees.] Rev. Hort. 94: 260. 1922.—Some evidence is presented for and against the practice. Detailed experimental work is suggested.—*E. J. Kraus.*

6381. Macoun, W. T. **Recent developments in plant breeding.** Canadian Hort. 46: 141–160. 1923.—The author points out that the need for better varieties to take the place of the fruits and vegetables already on the market and for more beautiful varieties among ornamental plants has become more and more impressed upon horticultural workers.—Some of the difficulties in plant breeding are noted particularly with reference to pollen germination. In transmission of characters valuable information is accumulating, as for example the ability of the McIntosh apple to transmit its characters to its seedlings.—*E. F. Palmer.*

6382. Munn, M. T. **Testing lawn grass seed mixtures.** Seed World 12^{10}: 21. 1922.—The author states that seedsmen should exercise greater care in preparing lawn grass seed mixtures. Many mixtures contain excessive amounts of inert matter and are foul with weed seeds of many kinds. They are also weighted with the heavy grass seeds. Wide variations in results may occur when testing these mixtures.—*M. T. Munn.*

6383. Nomblot-Bruneau. **Bigarreau Gustav Dupau.** [The cherry, Gustav Dupau.] Rev. Hort. 94: 56. *1 pl. (col.).* 1922.—The tree, distributed in 1922, is productive, hardy, and vigorous. The fruit has yellow, firm flesh, of very good quality.—*E. J. Kraus.*

6384. Palmer, E. F. **The pollination of fruits.** Canadian Hort. 44: 173–188. 1921.—A brief discussion is given of self-sterility and self-fertility of various deciduous tree fruits and grapes, together with the results of investigations in grape pollination.—*E. F. Palmer.*

6385. Petit, A. **L'ensachage des fruits influe-t-il sur la durée de leur conservation.** [Does the bagging of fruits influence the length of time they may be kept?] Rev. Hort. 94: 76. 1922.—Neither the time, nor the conditions of keeping of apples, at least, is influenced by bagging.—*E. J. Kraus.*

6386. Petit, A. **Résistance des sarments à la dessication.** [Resistance of grape shoots to drying.] Rev. Hort. 94: 61. 1922.—Shoots subjected to marked drying out should be

placed in water several hours before being used in propagation. Buds on such soaked shoots start several days in advance of those not so treated. Shoots dessicated for 31 days had 36.9 per cent moisture as compared with 48.5 per cent in those freshly cut. Buds from such dried shoots were delayed 8 days in starting.—*E. J. Kraus.*

6387. Shoemaker, J. S. **Cause of lime-sulphur injury.** Canadian Hort. 46: 117–140. 1923.

6388. Shull, C. A. **Fundamentals of fruit production.** [Rev. of: Gardner, V. R., F. C. Bradford, and H. D. Hooker, Jr. **The fundamentals of fruit production.** *xvi + 686 p.* McGraw-Hill Book Co.: New York, 1922 (see Bot. Absts. 12, Entry 452).] Bot. Gaz. 75: 103. 1923.—The reviewer commends the large number of literature citations presented, amounting to nearly 1000. He further commends the attention the authors have given to the rôle of fundamental science in the realm of horticulture and states that "if its publication leads to the requirement of larger training for students of horticulture in fundamental physics, chemistry and physiology, a great service to horticultural science has been rendered."—*B. W. Wells.*

6389. Stockdale, F. A. **The cultivation of pineapples in Ceylon.** Dept. Agric. Ceylon Bull. 50. *12 p., 4 pl.* 1921.—The subject is considered generally and from an agricultural and commercial standpoint in reference to Ceylon conditions.—*E. D. Merrill.*

6390. Vidault, A. **La multiplication d l'oranger. [The propagation of the orange.]** Rev. Hort. 94: 76–77. 1922.

6391. Wickson, E. J. **California fruits and how to grow them.** *9th rev. ed., 508 p., 15 pl., 93 fig.* Rural Pacific Press: San Francisco, 1921.—This is a manual of methods used in the production of fruits under California conditions. The following chapter headings indicate the nature of the contents. Part I: 6 chapters dealing with climate, soils, wild fruits, Mission fruits, and the place of California in the fruit industry of America. Part II treats of the culture of fruits in 9 chapters: clearing the land; the nursery, budding and grafting; preparation of soil and trees for planting; pruning and thinning of trees and fruit; tillage; fertilizers; and irrigation. Part III: 9 chapters on the fruits themselves,—apple, apricot, cherry, peach, nectarine, pear, plum, prune, and quince. Part IV: 4 chapters on the grape,—the industry, propagating and planting, pruning and care, and varieties. Part V: 8 chapters on semi-tropical fruits,—the avocada, date, fig, olive, orange, pomelo or grape fruit, lemon, and minor ones. Part VI: 1 chapter, on berries and currants. Part VII: 3 chapters on nuts,—the almond, walnut, and minor ones. Part VIII: a chapter on fruit preservation,—canning, crystallizing, and drying. Part IX: 4 chapters on fruit protection,—injurious insects, diseases, suppression of injurious animals and birds, and wind and frost. Part X: a chapter on utilization of fruit wastes; and a topical index.—*Guy L. Philp.*

6392. Ziegler. **Über die züchterische Verbesserung des weissen Burgunders im Jahre 1922. [On the improvement by breeding of white Burgundy (grape) in 1922.]** Mitteil. Deutsch. Landw. Ges. 38: 355–357. 1923.—This progress report gives an account of selection and breeding work being done with this variety at various stations in Germany.—*A. J. Pieters.*

FLORICULTURE AND ORNAMENTAL HORTICULTURE

6393. Anonymous. **Antirrhinum under glass.** Jour. Roy. Hort. Soc. 48: 92–97. 1923.—A test was made of growing Antirrhinum in pots under glass. A classified description of varieties showing awards and notes is given.—*J. S. Bailey.*

6394. Anonymous. **Dahlias at Wisley, 1922.** Jour. Roy. Hort. Soc. 48: 98–105. 1923.—A trial was made of 16 classes of Dahlias including over 80 varieties. This included those receiving awards the previous year and new varieties not previously tested. A classified list showing awards made and giving descriptions of new varieties is given.—*J. S. Bailey.*

6395. Anonymous. **New or noteworthy plants in the Society's gardens, III.** Jour. Roy. Hort. Soc. 48: 60–64. *Fig. 22–23.* 1923.—The introduction, culture, and value of *Primula Winteri, Primula Juliae, Lonicera thibetica,* and *Rhododendron hemitrichotum* are discussed.—*J. K. Shaw.*

6396. Anonymous. **Notes on Rhododendrons.** Rhododendron Soc. Notes 2: 107–109, 112–142. 1922.—Notes under varying titles by 16 members of the Rhododendron Society are given on the flowering, ornamental merits, hardiness, behavior, etc., of Rhododendrons in different places in the British Isles.—*Alfred Rehder.*

6397. Anonymous. **Summer flowering stocks at Wisley, 1922.** Jour. Roy. Hort. Soc. 48: 113–120. 1923.—Stocks (150 varieties) were set out for trial. The awards of the judges, classified descriptions, and notes are given.—*J. S. Bailey.*

6398. Anonymous. **Sweet peas at Wisley, 1922.** Jour. Roy. Hort. Soc. 48: 106–112. 1923.—Stocks (160) of Spencer sweet peas, including only those of pale pink shades, were tested. A classified list is given showing the awards made and including brief descriptions.—*J. K. Shaw.*

6399. Anonymous. **Violas at Wisley, 1922.** Jour. Roy. Hort. Soc. 48: 121–133. 1923.—Stocks (221) of Violas were set out for trial and judged as to their bedding or exhibition value. The awards of the judges, classified descriptions, and notes are given.—*J. S. Bailey.*

6400. Boscawen, A. T. **Some New Zealand trees and shrubs in Cornish gardens.** Jour. Roy. Hort. Soc. 48: 1–8. *Fig. 1–7.* 1923.—Many species representing *Pittosporum, Metrosideros, Leptospermum, Olearia, Senecio, Myrtus, Fagus, Hoheria, Gaya, Corokia,* and others are discussed. Their qualities as ornamental plants are considered, cultural directions given, and opinions of their value in England expressed.—*J. K. Shaw.*

6401. Chittenden, F. J. **The award of garden merit II.** Jour. Roy. Hort. Soc. 48: 58–59. *Fig. 19–21.* 1923.—This article discusses the culture, habit, and value as ornamental plants of *Stranvaesia undulata, Pyracantha Gibbsii,* and *Rubus biflorus quinqueflorus.*—*J. K. Shaw.*

6402. Correvon, H. **Les Romneyas.** [The Romneyas.] Rev. Hort. 94: 209–210. *Fig. 66.* 1922.—*R. trichocalyx* is fully hardy at Geneva, blooming profusely there; *R. Coulteri* is less hardy. A hybrid between the species is intermediate in character, and very vigorous.—*E. J. Kraus.*

6403. Coutts, J. **Lilies.** Jour. Roy. Hort. Soc. 48: 22–37. 1923.—Some of the practices of lily culture are discussed very briefly. Several methods of propagation are given, indicating the species to which they are suited. Certain species are better suited to pot or greenhouse culture than others. A number of species are listed with brief notes of origin, habit of growth, cultural requirements, etc. Attention is called to the very small number of hybrids found in this genus.—*J. S. Bailey.*

6404. Daveau, J. **A propos de la floraison du Phyllostachys aurea.** [Concerning the flowering of P. aurea.] Rev. Hort. 94: 215. *Fig. 68.* 1922.—The caryopsis of this bamboo is figured.—*E. J. Kraus.*

6405. Duryea, Minga Pope. **Gardens in and about town.** *xvi + 183 p., 97 fig.* E. P. Dutton & Co.: New York, 1923.—Foreword by Richardson Wright.—Fourteen chapters on: the heritage of the brownstone front; with its back to the street; the garden in a well; architecture and city gardens; the community garden; hanging gardens; gardens on the roof of the world; gardens on the edge of town; gardens in windows; screening the objectionable; furnishing the city garden; plants that will grow; care of city gardens; four seasons in town.—*C. S. Gager.*

6406. Eley, Charles. **Concerning stocks on which to graft Rhododendrons.** Rhododendron Soc. Notes 2: 110–111. 1922.—The superiority of *Rhododendron caucasicum* hybrids over *R. ponticum* as stock for grafting is emphasized and attention is drawn to the use of *R. Smirnowii* as stock, which seems to be well adapted for that purpose.—*Alfred Rehder.*

6407. Gérôme, J. **Au sujet du Camellia; sa multiplication.** [Concerning the Camellia; its propagation.] Rev. Hort. 94: 193–194. *Fig. 62.* 1922.

6408. Gérôme, J. **Au sujet du Camellia, son importance horticole, autrefois et maintenant.** [Concerning the Camellia, its past and present horticultural importance.] Rev. Hort. 94: 172–174. 1922.

6409. Guillaumin, A. **Les monstruosites florales des Dahlias.** [Monstrosities in Dahlia flowers.] Rev. Hort. 94: 259. *Fig. 83–84.* 1922.—At the center of the disc the axis is prolonged and another disc is formed more than 1 cm. above the lower one. The latter bears a single row of ligulate flowers at its margin; the 2nd disc bears both ligulate and tubular flowers. The effect is decorative; the variety should prove of horticultural value.—*E. J. Kraus.*

6410. Hesse, A. **Picea Breweriana Wats.** Rev. Hort. 94: 97. *Fig. 35.* 1922.

6411. Leray, C. **Le Rhododendron calophytum Franch.** Rev. Hort. 94: 187–188. *Fig. 57–59.* 1922.

6412. Leray, C. **Un interessant sapin pleureur: le Picea Breweriana Wats.** [An interesting weeping spruce; Picea Breweriana Wats.] Rev. Hort. 94: 49–50. *Fig. 14.* 1922.—Distribution, description, and decorative value are discussed.—*E. J. Kraus.*

6413. Lesourd, T. **L'Iris chez les anciens.** [The iris among the old horticulturists.] Rev. Hort. 94: 98–100. *Fig. 36–37.* 1922.—Historical notes are given on early varieties and species.—*E. J. Kraus.*

6414. Magnier, C. **Polemonium Magnieri.** Rev. Hort. 94: 81. 1922.

6415. Mottet, S. **Deux nouvelles Clématites.** [Two new Clematis.] Rev. Hort. 94: 213–215. *Fig. 67, 1 pl. (col.).* 1922.—The forms are hybrids between *C. Spooneri* × *C. montana rubens*, and *C. Spooneri* × *C. vedrariensis*. The forms are very similar in both cases, resembling *C. Spooneri* except that the flowers are rose colored; hence the name *C. Spooneri rosea* has been applied.—*E. J. Kraus.*

6416. Mottet, S. **Ipomée a grande fleur bleue très hative.** [Very early, large flowered, blue Ipomoea.] Rev. Hort. 94: 78–80. *1 pl. (col.), fig. 32.* 1922.

6417. Mottet, S. **Les iris a fleurs d'orchidée.** [Orchid flowered irises.] Rev. Hort. 94: 236–237. *1 pl. (col.)* 1922.—The possible value of several species as parents of new varieties is discussed. Descriptions are given of a number of varieties, more or less new.—*E. J. Kraus.*

6418. Mottet, S. **L'oeillet de Chine royal.** [The royal strain of the Chinese pink.] Rev. Hort. 94: 102–103. *Fig. 38, 1 pl. (col.)* 1922.

6419. Mottet, S. **Lycoris aurea.** Rev. Hort. 94: 51–52. *Fig. 15.* 1922.

6420. Proschowsky, A. R. **Floraison d'une variété de Phyllostachys aurea.** [Blooming of a variety of P. aurea.] Rev. Hort. 94: 108. 1922.—Mainly because of differences in color from that of the type, the variety is named *P. aurea viridi glaucescens.*—*E. J. Kraus.*

6421. Proschowsky, A. R. **Ipomée a grande fleur bleue très hative. [Very early, large flowered, blue Ipomoea.]** Rev. Hort. 94: 78–80. 1922.

6422. Proschowsky, A. R. **Sasa paniculata Makino et Shibata.** Rev. Hort. 94: 134. 1922.

6423. Rivoire, A. **Quelques plantes grimpantes de serre. [Some climbing greenhouse plants.]** Rev. Hort. 94: 254–256. *Fig. 82.* 1922.—Brief descriptive and cultural notes are given on *Allamanda Hendersonii, Gloriosa Sanderiana, Abutilon vexillarium.* Species of *Swainsonia, Passiflora,* and *Dipladenia* are suggested.—*E. J. Kraus.*

6424. Slooten, D. F. van. **Index Combretacearum quae anno 1921 in horto botanico bogoriensi coluntur. [List of Combretaceae cultivated in 1921 in the Botanic Garden at Buitenzorg.]** Bull. Jard. Bot. Buitenzorg III, 4: 281–282. 1922.

6425. Slooten, D. F. van. **Index Verbenacearum quae anno 1921 in horto botanico bogoriensi coluntur. [List of Verbenaceae cultivated in 1921 in the Botanic Garden at Buitenzorg.]** Bull. Jard. Buitenzorg III, 4: 283–287. 1922.

6426. Stern, F. C. **Gardening on chalk.** Jour. Roy. Hort. Soc. 48: 9–15. *Fig. 8, 10.* 1923.—Experience in growing ornamental plants on chalk in a garden on the Sussex downs is given. The original vegetation consisted of sycamore trees, *Viburnum lantana,* blackberries, dogwood, wild clematis and apple and pear trees. It was found that if the hard rock chalk was broken up to a depth of 2–3 feet, all trees and shrubs that tolerate lime grew well. Azaleas, Styrax, and Rhododendrons with the exception of *R. rubiginosum* did not tolerate lime. The Japanese and North American floras as a general rule dislike lime. Observations of the behavior of many shrubs and some annual plants on various kinds of chalk soils are given.—*J. K. Shaw.*

6427. Tesnier, F. **La floraison des iris. [The flowering of irises.]** Rev. Hort. 94: 174. 1922.—A list is given of species and varieties, with period of flowering.—*E. J. Kraus.*

6428. Thomas-Javit, G. **Observations sur la culture de l'Ipomoea rubro-caerulea. [Observations on the culture of I. rubro-caerulea.]** Rev. Hort. 94: 109. 1922.—The plant may be grown in the open as an annual if old seed, the coats of which have been broken before soaking, are planted in April and the plants transferred to open ground in May.—*E. J. Kraus.*

6429. Waller, L. D. **Flower seed industry in California.** Seed World 10^2: 15–18. 1921.

6430. Wickson, E. J. **California garden flowers, shrubs, trees and vines.** *2nd ed., rev. 255 p., 15 pl., 12 fig.* Pacific Rural Press: San Francisco, 1923.—This text of 6 parts and 28 chapters is designed primarily for the working amateur giving suggestions of California conditions, cultural treatments, and adaptations of flowers; also, the selection of shrubs, trees, vines, and protection against plant pests.—*Guy L. Philp.*

6431. Wright, Richardson. **Flowers for cutting and decoration.** *xi + 218 p., 20 fig.* E. P. Dutton & Co.: New York, 1923.—The book consists of the following 12 chapters: five garden perplexities; the nursery and the cutting garden; annuals and biennials for cutting; cut flowers from tubers and bulbs; perennials for cutting; some of the flowering shrubs; roses indoors and out; cutting and arranging flowers; bouquets for spring, summer, and autumn; winter bouquets from summer flowers; the garden still room; after frost.—*C. S. Gager.*

VEGETABLE CULTURE

6432. Anonymous. **Beet at Wisley, 1922.** Jour. Roy. Hort. Soc. 48: 68–73. 1923.—The awards, notes, and descriptions based on the tests of 107 stocks of beets are given. Special attention is called to regaining of purity of seed since the war and to the value of round varieties as vegetables.—*J. S. Bailey.*

6433. Anonymous. **Broad beans at Wisley, 1922.** Jour. Roy. Hort. Soc. 48: 74–78. 1923.—The results of the test of 83 stocks of broad beans are given. Awards are announced and a classified list of varieties is presented.—*J. S. Bailey.*

6434. Anonymous. **Celeriac at Wisley, 1921–22.** Jour. Roy. Hort. Soc. 48: 84–85. 1923.—Thirteen stocks of celeriac were set out for trial. The awards, description, and notes of the judging committee are given.—*J. S. Bailey.*

6435. Anonymous. **Celery at Wisley, 1921–22.** Jour. Roy. Hort. Soc. 48: 79–83. 1923.—Sixty stocks of celery were placed under trial. A list of awards, descriptions, and notes by the fruit and vegetable committee is given.—*J. S. Bailey.*

6436. Anonymous. **Late peas at Wisley, 1922.** Jour. Roy. Hort. Soc. 48: 86–91. 1923.—Stocks of peas (143) were tested. The qualities considered by the judges are enumerated, and awards, classified descriptions, and notes are given.—*J. S. Bailey.*

6437. Barr, J. E. **Summary of vegetable seed situation.** Seed World 13^{7}: 13–14. 1923.

6438. Buisson, J. M. **Le melon Kroumir Parisien.** [**The melon Kroumir Parisien.**] Rev. Hort. **94**: 126–127. *1 pl. (col.)* 1922.—The author states that this melon is better, thicker fleshed, and usable through a longer season than the cantaloupe.—*E. J. Kraus.*

6439. Guelf, C. P. **Thousands of acres of radishes grown in Michigan for seed.** Seed World 12^{12}: 34–35. 1922.

6440. Loizeau, A. **La tomate pour l'exportation.** [**The tomato for export.**] Rev. Hort. **94**: 73–75. *Fig. 26–30.* 1922.

6441. Morse, L. L. **Growing lettuce seed in Santa Clara Valley.** Seed World 12^{6}: 13–14. 1922.

6442. Morse, L. L. **Growing onion bulbs in California.** Seed World 13^{9}: 20–21. 1923.

6443. Morse, L. L. **Growing onion seed in California.** Seed World 13^{6}: 13–14. 1922.

6444. Munn, M. T. **Practical value of germination tests and some factors affecting the test.** Seed World 11^{4}: 23. 1922.—The author states that the seed analyst should strive to make germination tests of truck-crop seeds in such manner and under such conditions as will give the grower information of the greatest practical value.—*M. T. Munn.*

6445. Reichelt. **Sortenanbauversuche mit Frühkarotten.** [**Variety tests of early carrots.**] Mitteil. Deutsch. Landw. Ges. 38: 141–143. 1923.—A report is made on 2 varieties, "Pariser Markt" and "Duwiker," at 6 stations. The latter gave the largest yields at all stations.—*A. J. Pieters.*

6446. Sörensen, S. **Garden seed industry in Denmark.** Seed World 13^{5}: 18–19. 1923.—Seed activities in Denmark are described.—*M. T. Munn.*

6447. Thurlimann, Leota. **Commercial garden seed laboratory problems.** Seed World 12^{5}: 13–14. 1922.—Many problems arise in the germination testing of garden seeds which

should be solved by careful research. The important problems discussed are: dormancy in germination; germination versus viability; cause of abnormal sprouts; moldiness in testing; carry-over stock; and need of experimental work. The difficulties encountered in testing flower seeds is discussed.—*M. T. Munn.*

6448. Vaughan, L. H. **Safeguards in the garden seed business.** Seed World 12[1]: 34. 1922.

6449. White, K. S. **Some objections to governmental control of garden seed sales.** Proc. Assoc. Official Seed Analysts North America 1919: 28–30. 1921.—The author expresses the belief that state control of garden seed sales is not worth what it costs with the possible exception that packages be dated as to the year of output.—*M. T. Munn.*

6450. Wickson, E. J. **The California vegetables in garden and field.** *5th rev. ed., 319 p., 23 pl., 6 fig.* Pacific Rural Press: San Francisco, 1923.—This book of 39 chapters thoroughly covers the field of vegetable growing under California conditions, including a discussion of soils, irrigation, fertilizers, drainage, garden location and arrangement, propagation and planting, together with a treatment of the several crops grown.—*Guy L. Philp.*

HORTICULTURAL PRODUCTS

6451. Cruess, W. V., and J. H. Irish. **Fruit beverage investigations.** California Agric. Exp. Sta. Bull. 359. *526–567.* 1923.—Most of the so-called fruit beverages now on the market contain little or no fruit juice. Excellent syrups and carbonated beverages may be made from loganberries, raspberries, oranges, lemons, and apples, and from blends of strawberries with blackberries, of Muscat with red wine grapes, of raisins with oranges and lemons, and of loganberries, red grapes or pomegranates with oranges and lemons. Sugar was used in the preparation of all syrups except those made from grapes and apples. Concentration by freezing and in a glass lined vacuum pan were both satisfactory methods of concentrating grape, apple, and citrus fruit juices. Syrups were preserved satisfactorily by pasteurizing in glass at 175°F. for 30 minutes, or by storage at 0–15°F. in sealed containers, without pasteurization. Glass containers were better than enamel-lined tin containers for pasteurized syrups. Preservatives imparted a disagreeable flavor and their use is not recommended. The syrups were found excellent for the preparation of carbonated bottled beverages, for soda fountain use, the preparation of centers for candies, and for home use in the preparation of punch, gelatin desserts, sauces, jellies, etc. Loganberry, grape, strawberry-blackberry blend, apple, raspberry, and fruit punch bottled carbonated beverages have retained their flavor and color satisfactorily for 6–15 months. Orange, lemon, and strawberry deteriorated markedly in quality after 2 months' storage. Pasteurizing at 150°F. for 30 minutes destroyed yeasts and prevented spoiling of carbonated fruit beverages heavily inoculated with yeast, mold, and bacteria. Heat-resistant molds and bacteria were not killed by this treatment, but the carbon dioxide prevented their development. As a result of the investigations the writers are convinced that carbonated fruit beverages can be made and sold at retail for 10 cents a bottle with a profit to all concerned. A large proportion of the surplus and cull fruits of California might be utilized to advantage in the preparation of fruit syrups and carbonated beverages.—*A. R. C. Haas.*

6452. Irish, J. H. **Pear by-products.** California Agric. Exp. Sta. Circ. 259. *4 p.* 1923.—The purpose of the investigations here reported is to discover new outlets for cull pears in the form of by-products. Methods and preparation are given for the utilization of cull pears as spread, vinegar, candy, and syrup.—*A. R. C. Haas.*

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

(See also in this issue Entries 6212, 6230, 6231, 6245, 6295, 6404, 6409, 6514, 6607, 6650, 6654, 6689, 6693, 6694, 6705)

6453. Arber, Agnes. **On the 'Squamulae intravaginales' of the Helobieae.** Ann. Botany 37: 31–42. *5 fig.* 1923.—Squamulae intravaginales are very small scale-like structures found among the leaf-bases of the Helobieae and certain Araceae. A study of serial sections of the stem apex of several species shows that they are appendages not of the leaf, in the axil of which they occur, but of the surface of the internode which separates this leaf from the one next above. In terms of the "leaf-skin" theory of Saunders, which the author favors, they are to be regarded as dorsal outgrowths from a downward skin-like prolongation of the leaf next above and are therefore not related to stipules or ligules as has been suggested.—*W. P. Thompson.*

6454. Bower, F. O. **Size, a neglected factor in stelar morphology.** Proc. Roy. Soc. Edinburgh 41: 1–25. *Fig. 1–19.* 1920.—This article presents an application of the principle of similar structures, enunciated by Galileo, to the vascular system of plants. Other things being equal, the rate of interchange of substances in solution is proportional to the tissue-surface involved. For each form of structure there is a size limit beyond which sufficient rapidity of interchange will be impossible without modification in form or quality of the tissue-surface through which diffusion must occur. This applies to internal limiting surfaces as well as external. The endodermis forms both a structural and a physiological barrier between the stele and the surrounding tissues, regulating by its own protoplasts all exchange of soluble substances. As the sporeling develops into the adult fern there is reached a limit in size of the stem beyond which the conically enlarging stele cannot supply the surrounding tissues, unless there is deviation on the part of the endodermal surface from the simple conical form. The protostele, the most primitive stelar condition, is found in all juvenile forms and is retained in the adult stem of some ferns. When larger dimensions of the stele were attained the problem of the limiting endodermis was solved by: (1) corrugation and involution of its surface as in the fossil forms *Ankyropteris Grayi*, *Asterochlaena laxa;* (2) the interruption of the endodermal barrier and the development of meristeles as in *Osmundites skidegatensis* and *O. Carnieri;* (3) in the Leptosporangiatae, a transformation of the protostele, giving rise to the solenostelic, dictyostelic, and eventually the polystelic condition. These modifications all result in an increase in endodermal surface in proportion to bulk of stelar tissue and are accompanied by a great increase in transverse section of the stele. They may be traced in both ontogeny and phylogeny and perhaps account for the great success of the Leptosporangiate type. That size is not always the determining factor is shown by *Pandanus* in which there is no stelar disintegration, even in roots 5 cm. in diameter. The dicotyledons and gymnosperms have solved their problem by development of a cambium and the resulting secondary increase together with medullation.—*Ray C. Friesner.*

6455. Cole, L. W. **Teratological phenomena in the inflorescences of Fagus sylvatica.** Ann. Botany 37: 147–150. *2 fig.* 1923.—Abnormal female inflorescences were frequently observed showing hermaphrodite and male flowers on the cupules. There was a graded series from the normal female flowers through forms with more or less rudimentary inferior ovary and reduced androecium to typical male flowers with or without a vestigial superior ovary. The higher the insertion of the flower on the segment of the cupule the nearer it approached the normal male structure. Abnormal examples were also found in which the structure of the whole inflorescence was transitional to that of the male. Out of 355 female inflorescences gathered indiscriminately 17 per cent were abnormal in some way.—*W. P. Thompson.*

6456. Connors, C. H. **Twin and triplet peaches.** Jour. Heredity 14: 89–92. *3 fig.* 1923.—Double fruits are not uncommon on the peach, but in certain seasons are more numerous

than in others. These originate usually from twin blossoms but may come from double or triple pistils. Varieties of the Crawford or Persian group are more likely to form multiple fruits. It is an hereditary tendency which is enhanced by environmental factors tending to cause doubleness in the blossom.—*Author's abstract.*

6457. Cook, O. F. **Evolution of compound leaves in walnuts and hickories.** Jour. Heredity **12**: 77–88. *6 fig.* 1923.—Instead of the customary division of the leaves into 3 elements, 2 primitive elements may be recognized, the foot and the blade. The foot is the part of the primitive sheathing leaf-base that surrounded the succeeding internode. The blade is the expanded leafy portion. A distinct pulvinus at the end of the petiole may indicate the point of union of the 2 elements. In the walnuts and hickories no stipules are supposed to be present, but they may be recognized in the bud-scales, and in rudimentary organs that correspond directly with the lower pinnae of the compound leaf. Occasionally 1 or more pairs of pinnae other than the lower pinnae are replaced by stipule-like organs, and the leaf may be regarded as being made up of a number of these reduplicated stipules, only the terminal pinna representing the blade-element. Such reversions, and the combination of existing characters, are called metaphanic variations or "internal hybrids." This form of variation has particular evolutionary interest, as by it an organism continually tries out various combinations of characters that it already possesses.—*R. C. Cook.*

6458. Czaja, A. Th. **Studien zur Apogamie leptosporangiater Farne. I. Über die Apogamie der Pellaea atropurpurea (L.) Link. und das Auftreten von Tracheiden im Prothallium.** [**Studies on apogamy in leptosporangiate ferns. I. On apogamy in Pellaea atropurpurea and the occurrence of tracheids in the prothallium.**] Ber. Deutsch. Bot. Ges. **40**: 346–352. 1922.—In diffuse daylight 3 types of prothallia develop: (1) weakly developed males; (2) larger females with prosenchymatic tissue and tracheids in the central region, and a well defined meristem from which apogamous outgrowths develop; (3) very short sterile prothallia with only parenchymatous cells in the central region, a limited meristematic activity, and some apogamous outgrowths. Besides a few small males, only prothallia of type (3) are developed under blue glass, and only type (2) under red glass. Because tracheids appeared in prothallia having arrested apogamous growths. De Bary and Goebel regarded the tracheids as a result of the arresting influence, but this seems improbable in view of the fact that under red glass all the prothallia with tracheids showed good development on the part of the apogamous sporophytes. The presence of tracheids is more probably due to disturbances in the correlation between the differentiation of elements and the place at which the differentiation occurs. Such tracheids are precociously differentiated sporophytic elements.—*L. W. Sharp.*

6459. Debbarman, P. M. **A floral abnormality of the Indian water lily.** Jour. Heredity **14**: 96. *1 fig.* 1923.—A flower of *Nymphaea rubra* was observed in which a supernumerary flower had issued from the axils of 1 of the petals, and several of the stamens had developed into leaflike structures. The causes of this abnormal condition are not known.—*R. C. Cook.*

6460. Гоби, Х. Я. [Гови, Сн. Ja.] **Генетическая классиифкація плодов семенных растений.** [**The genetical fruit classification of angiosperms.**] Ann. Inst. d'Essais de Semences Jard. Principal Bot. Republique Russe **4**[4]: 1–30. 1921.—This classification is close to that of Warming (1880) but the genetical relations among the groups are illustrated. The classification is based primarily upon the difference between dehiscent and indehiscent fruit, the latter of which is believed to have originated from the former. The primitive form of dehiscent fruit is the capsule. From this have been derived the 3 chief types of indehiscent fruit, the nut, the berry, and the drupe. Different fruit types may be present in the same family. In the Oleaceae, for example, 4 are represented: *Olea* (drupe), *Syringa* (capsule), *Fraxinus* (samara), and *Ligustrum* (berry). The same thing is true for the Rubiaceae, Capparidaceae, and others. The author believes that the primitive capsulary type has become transformed in 3 different directions during the course of evolution.—*V. Lashevsky.*

6461. Graf, J. **Beiträge zur Kenntnis der Gattung Populus.** Ber. Deutsch. Bot. Ges. 39: 193–194. 1921.—[See Bot. Absts. 11, Entry 439.]—*Paul C. Standley.*

6462. Losch, Hermann. **Ascidienbildung an Staubfäden vergrünter Blüten von Tropaeolum majus.** [Formation of ascidia on stamens of greened flowers of T. majus.] Ber. Deutsch. Bot. Ges. 37: 369–372. 1919.

6463. Mann, Annette G. **Observations on the interruption of the endodermis in a secondarily thickened root of Dracaena fruticosa Koch.** Proc. Roy. Soc. Edinburgh 41: 50–59. *Fig. 1–11, photo. 1–2.* 1921.—Roots of *Dracaena* have a well indurated endodermis and a process of cambial increase similar to that of the stem. Serial transverse sections, beginning 1½ inches back of the root tip, showed a gradual formation of internal cambium from the pericycle, followed by a distortion and finally an interruption of the endodermis, and later a cessation of cambial activity and a linking up of the endodermal cells. At about 3¾ inches from the tip the endodermal ring is almost complete and external cambium begins to appear. This gradually spreads around the root. Near the region of the stem secondary structures are present both inside and outside the endodermis, which is now broken up into groups of cells. Once it is well established, the external cambium is more active than the internal.—*Ray C. Friesner.*

6464. Schüepp, Otto. **Zur Theorie der Blattstellung.** [On the theory of phyllotaxy.] Ber. Deutsch. Bot. Ges. 39: 249–257. 1921.

6465. Stevens, O. A. **Double sweet clover seeds.** Seed World 13[8]: 30. 1923.—In biennial white sweet clover and yellow-blossomed sweet clover 2-seeded pods are quite frequent, the seed lying side by side. The adjacent sides of the 2 seed are distinctly flattened.—*M. T. Munn.*

MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. Transeau, *Editor*

L. H. Tiffany, *Assistant Editor*

(See also in this issue Entries 6241, 6487, 6507, 6514, 6595, 6647, 6657)

6466. Bullock-Webster, G. R. **Some Charophyte notes 1917.** Irish Nat. 29: 55–58. 1920.—Records of distribution in Ireland, chiefly from Achill Island, are given.—*W. E. Praeger.*

6467. Crow, W. B. **Dimorphococcus Fritschii, a new colonial protophyte from Ceylon.** Ann. Botany 37: 141–146. *1 fig.* 1923.—The new species was collected in fresh water in Ceylon. Its comparative morphology and relationships are discussed.—*W. P. Thompson.*

6468. Crow, W. B. **The taxonomy and variation of the genus Microcystis in Ceylon.** New Phytol. 22: 59–68. *Pl. 1.* 1923.—A key is given for the 17 species of *Microcystis* considered to be fully known. Of these, 8 are recorded from Ceylon, including 2 new species (*M. protocystis* and *M. pseudofilamentosa*). A new form (f. *elongata*) of var. *incerta* (Lemm.) Crow of *M. pulverea* (Wood) Migula is also described. The species are shown to be connected by numerous transitional forms, the nature of which is described in the forms from Ceylon. The distinction between *Aphanocapsa* and *Microcystis* is an artificial one. *Coelosphaerium dubium* Grun. is related to the pseudovacuolate species of *Microcystis*. *Coelosphaeriopsis* Lemm. is not distinguished by a valid generic character.—*I. F. Lewis.*

6469. Griffiths, B. Millard. **Tetraedroides spetsbergensis gen. et sp. nov., a new alga from Spitzbergen.** New Phytol. 22: 69–71. *Pl. 2.* 1923.—The thallus of this new green alga of uncertain affinities is composed of 2 uninucleate cells with thick outer walls and many chloroplasts each containing a pyrenoid.—*I. F. Lewis.*

6470. Grubb, Violet M. **Preliminary note on the reproduction of Rhodymenia palmata, Ag.** Ann. Botany **37**: 151–152. *2 fig.* 1923.—The female fronds were discovered. The procarps are developed in groups in acropetal succession. Each one bears a long trichogyne with a distinct nucleus. Though no antheridial fronds were recognized, bodies resembling spermatia were found on the trichogynes.—*W. P. Thompson.*

6471. Grubb, Violet M. **The attachments of Porphyra umbilicalis (L.) J. Ag.** Ann. Bot. **37**: 131–140. *8 fig.* 1923.—The plant is commonly attached to rocks by small discs from 0.5 to several mm. in diameter. A disc is made up of interwoven filaments, some long and slender, others short and stout, which grow out from individual cells of the thallus. Filaments in contact with the substratum become attached by suckers or swell up and divide to give cells which are attached by their gelatinous walls. An endless variety of forms is assumed. Many filaments also turn outward and often cut off cells which form a compact outer parenchymatous tissue. This may creep along the substratum and produce new fronds. The plants sometimes grow on breakwaters and then the filaments have the power to penetrate the wood to considerable depths. In two plants growing on *Fucus* it was found that the filaments had penetrated far into the living tissues and even into the living cells of the host.—*W. P. Thompson.*

6472. Hall, Charles A. **Desmids of the Clyde area: new records.** Glasgow Nat. **8**: 122–127. 1920.—Forty-nine species and varieties of desmids, hitherto unreported for the area, are listed. This brings the total records for the area to 192 species and varieties.—*Ray C. Friesner.*

6473. Hitchcock, Romyn. **Tolypella longicoma in Cayuga Lake, New York.** Bull. Torrey Bot. Club **5**: 173–176. *Pl. 8.* 1923.—The occurrence of *Tolypella longicoma* A. Braun in Cayuga Lake is reported and the habit and structure are discussed.—*P. A. Munz.*

6474. Janet, Ch. **Sur l'ontogènèse du Volvox aureus Ehr.** [**The ontogeny of Volvox aureus.**] Compt. Rend. Acad. Sci. Paris **176**: 997–999. *1 fig.* 1923.—The figure shows successive bipartitions as exhibited in the surface layer. The final stage is said to contain 1,024 cells. The cells have a tetradic arrangement during the entire development. Each facet of a cell is determined by the tension of the protoplasmic and plasmodesmic connections. At each bipartition new plasmodesma appear; certain preexisting plasmodesma are retained unchanged; and certain other preexisting plasmodesma are multiplied.—*C. H. Farr.*

6475. Naumann, E. **Einige Gesichtspunkte betreffs der bildlichen Darstellung des Kammerplanktons.** [**Some aspects of the figurative representation of plankton.**] Archiv. f. Hydrobiol. u. Planktonk. **12**: 454–467. *5 fig.* 1920.—Methods of graphically representing the plankton collected in the Kolkwitz chamber are given. Previous methods of representing this chamber plankton suffer from limitations. For larger organisms a low magnification of the whole chamber area of 1 square cm. may be used, but for smaller forms a higher magnification of only a part is better. For these 1 square mm. is adopted, and the projection of organisms from a column of the usual chamber height of 2.63 mm. made. When the organisms are more numerous a depth of 1 mm. may be used, and $\frac{1}{10}$ mm. when very numerous. For organisms which are so infrequent that they cannot be detected in 1 cmm. a determination may be made of the frequency in 1 cc.—*Harold Kirby.*

6476. Oehler, Rud. **Flagellaten- und Ciliatenzucht auf reinem Boden.** [**Flagellate and ciliate culture.**] Arch. Protistenk. **40**: 16–26. 1919.—Species of *Bodo* and *Prowazekia* were grown on pure strains of the bacteria *Coccus pyogenes flavus, Vibrio metschnikof, Bacterium timothea,* and *B. coli,* and also on *B. coli* killed by heating. Both the agar-plate and agar-tube methods were successful. The ciliates *Colpoda steinii* and *Colpidium colpoda* were also grown in culture by the same methods. Various sterile organic culture media, such as peptone, beef extract, and egg white, were found to be much less favorable than media containing bacteria.—*R. P. Hall.*

6477. Pascher, A. **Über die übereinstimmungen zwischen den Diatomeen, Heterokonten und Chrysomonaden. [The relation between the Diatoms, Heterokonts, and Chrysomonads.]** Ber. Deutsch. Bot. Ges. 39: 236–248. 1922.—The Chrysomonads, Diatoms, and Heterokonts may be united into a basic group, the **Chrysophyceae**. They show similarity in wall structure, this having in representative forms at least in one phase of development a lamellate structure, as in *Hyalobryon*, *Rhabdoderma*, and *Tribonema*. The wall is also frequently in 2 halves, as in Chrysomonad cysts, most Diatoms, and *Ophiocytium*. Silicification may be present as in Chrysomonad cysts, *Mallomonas*, some Heterokontae (*Halosphaera*), and Diatoms. Flagellation is somewhat similar, 1 flagellum or 1 long and 1 very short one being present, but little is known regarding the flagellae on reported Diatom zoospores. The pigments show some differences, but the most divergent group, the Heterokontae, may be a side line early distinguished by a loss of brown color. The Heterokonts and Chrysomonads have in common leucosin as the assimilate, and all have oils and fats.—*Wm. Randolph Taylor.*

6478. Sampaio, Joaquim. **Desmideáceas do Porto e arredores. [Desmids from Oporto and vicinity.]** Brotéria Sér. Bot. 20: 26–48. *Pl. 1.* 1922.—This list contains 101 species in 17 genera, mostly with rather complete descriptions. Of them, 38 were previously unreported for the Portuguese flora and 51 unreported in the vicinity of Oporto. *Closterium varzinense*, *Cosmarium stagnale*, and *C. portuense* are proposed as new species; *Micrasterias denticulata* var. *lusitanica* and *Cosmarium subtumidum* var. *minor* as new varieties. The authority in all cases is Sampaio f.—*E. B. Chamberlain.*

6479. Sauvageau, C. **Sur l'état quiescent prolongé d'une Algae phéosporée éphémère. [On the quiescent stage prolonged in an ephemeral pheosporic alga.]** Compt. Rend. Acad. Sci. Paris 176: 478–482. 1923.—Most attention is given to a study of *Mesogloia Griffithsiana*. This alga appears only for a short period; later it cannot be found. It was grown in culture in an attempt to find the other stages in the life history. These are carefully described. Brief reference is also made to other members of the Chordariaceae.—*C. H. Farr.*

6480. Schulz, P. **Fragilaria exigua (W. Sm.) Lemm., ein Beitrag zum Variabilitätsvermögen der Bacillariaceen. [A contribution to the variability of the Bacillariaceae.]** Arch. Hydrobiol. u. Planktonk. 12: 750–755. *16 fig.* 1920.—A series of transitional forms between the cross-formed *Fragilaria construens* var. *genuina* Grun. and the tripolar *F. exigua* is described and illustrated. This is the 1st observed case of the origin of a tripolar from a cross form and suggests that *F. exigua* is only a variety of *F. construens*. Similarities are noted to the fossil *F. pacifica* var. *trigona* J. Brun and *F. parasitica* var. *trigona* Grun., showing the existence of tripolar variants in other species of *Fragilaria.—Harold Kirby.*

6481. Svedelius, N. **Einige Bemerkungen über Generationswechsel und Reductionsteilung. [Some remarks on alternation of generations and the reduction division.]** Ber. Deutsch. Bot. Ges. 39: 178–187. 1921.—The discovery of the life cycle of *Laminaria* renders untenable the theory of Bower and Wettstein in which the reduction of the gametophyte generation is considered an adaptation to a terrestrial habit, because the series *Dictyota-Laminaria-Fucus* shows a comparable series in aquatic plants. The discovery that the reduction division occurs at different points in the life history in 1 group (e.g. Florideae) shows that the point of occurrence of this phase is not necessarily a fundamental feature of such a group. Fertilization permits of but little variety in the sorting of chromosomes while the reverse is true of the reduction divisions, which fact is of importance in plant variability and evolution. As a hypothesis it is suggested that the establishment of a diploid sporophyte through the postponing of the reduction divisions gives the plant the chance to effect many reduction divisions and so many more fundamental combinations of chromosomes. The diploid plant can produce the greater effect with the least material output provided the vegetative efficiency of the gametophyte is not greater than that of the sporophyte. The life history in which there is 1 reduction division following fertilization directly is that of primitive organisms, while that of fertilization followed by a sporophyte giving many reduction divisions

is more evolved. The gradual reduction of the gametophyte has occurred because this form has become increasingly unnecessary.—*Wm. Randolph Taylor.*

6482. Virieux, J. **Structure et division cellulaires chez Coscinodiscus Grani. [Structure and cellular division in C. Grani.]** Bull. Biol. France et Belgique 54: 58–60. *Fig. 1–6.* 1920.—Studies of cytology, structure, and nuclear division of diatoms have been based mostly on fresh water species. The pelagic dredging of Wimereux yielded a great quantity of *C. Grani* Good. The nucleus, subcentral in repose, is seen as a voluminous, easily stained caryosome in a clear envelope. Surrounding it is a mass of rather compact protoplasm with prolongations reaching toward the valves and making connection with the parietal chromatophores. At the time of division the caryosome becomes more or less obliterated and its parts are aggregated in 2 masses of granules. Only in this brief stage is anything found which resembles chromosomes. The caryosomes shortly form again, withdraw toward the 2 poles, and become fixed against the valves with only a bridge of protoplasm uniting them. Two new valves then form at the equator and do not at once break the continuity of the protoplasm, strands of which extend through the large hexagonal pores of the valvular poles. The 2 daughter cells are united for a time in the maternal envelope, and only when they separate do the nuclei move to the centers of the new cells.—*A. Chase.*

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

(See also in this issue Entries 6226, 6232, 6241, 6246, 6514, 6647, 6649, 6657, 6727)

6483. Dismier, G. **Additions à la flore bryologique des Alpes-Maritimes et du Var. [Additions to the bryophyte flora of the Maritime Alps and the Var.]** Bull. Soc. Bot. France 67: 35–47, 113–120. 1920.—The present paper is supplementary to an earlier work on the bryophytes of the French department of the Maritime Alps published in 1915. It records the results of explorations carried on by the author during the winter of 1916–17, using Cannes as a base of operations. The region studied extended from Antibes to Aguay and was almost wholly coastal in character, the most inland station visited being scarcely 10 km. from the Mediterranean. The author first lists, as new to continental France, *Acaulon mediterraneum* Limpr., *Pottia commutata* Limpr., and *Rhyncostegiella Letourneuxii* (Besch.) Broth. The last is of especial interest, having been previously recorded only from Algeria and Morocco. It includes, however, as synonyms, *Eurhynchium curvisetum* var. *laevisetum* Nich. & Dix., of Portugal, and *Rhynchostegiella littorea* var. *brevifolia* Amann, of southern France, so that it is not actually new either to Europe or to France. He then lists, with definite stations, 54 mosses and hepatics as new to the department of the Maritime Alps and 31 as new to the department of the Var.—*A. W. Evans.*

6484. Dismier, G. **Les Muscinées du Valentinois méridional (Drôme). [The bryophytes of southern Valentinois (Drôme).]** Bull. Soc. Bot. France 68: 241–248. 1921.—In 1918 the author made a protracted stay at Étoile-sur-Rhône, near Valence, in the department of the Drôme, France, and carefully explored the surrounding country for bryophytes. The region is dry, sparsely wooded, and almost destitute of rocks, while the range in altitude is comparatively slight. In spite of these rather unfavorable conditions 170 mosses and 31 hepatics were collected, and these are listed in full, since the bryophytes of the Drôme were previously unknown. Although the species are predominantly southern in distribution a few northern species are represented. The following are of especial interest: *Amblystegium riparium* var. *trichopodium* Br. Eur., *Aschisma carniolocum* (W. & M.) Lindb., *Cheilothela chloropus* Lindb., *Didymodon cordatus* Jur., *Phascum mitraeforme* (Limpr.) Warnst., and *Zygodon Forsteri* (Dicks.) Wils.—*A. W. Evans.*

6485. Dismier, G. **Une mousse nouvelle pour la France dans la Drôme: Orthotrichum Shawii Wils., et présence aux environs de Valence des Camptothecium aureum Br. Eur. et Epipterygium Tozeri (Grev.) Lindb.** [**Orthotrichum Shawii, a moss new to France in the Drôme, and the occurrence in the vicinity of Valence of Camptothecium aureum and Epipterygium Tozeri.**] Bull. Soc. Bot. France 69: 321–325. 1922.—The author reports the presence of *Orthotrichum Shawii* in the vicinity of Die, in the department of the Drôme, France. This rare species was previously known only from Scotland, northern Germany, and Corsica. Of the other 2 species noted in the title, *Camptothecium aureum* has a wide Mediterranean distribution but was previously unknown in the interior of France, while *Epipterygium Tozeri* was likewise supposed to be restricted to coastal regions. The latter species consistently avoids calcareous rocks.—*A. W. Evans.*

6486. Showalter, Amos M. **Studies in the morphology of Riccardia pinguis.** Amer. Jour. Bot. 10: 148–166. *Pl. 16–19, 3 fig.* 1923.—This species is cosmopolitan and varies somewhat under different environments. It is probably dioecious but male and female thalli may be distinguished only by their reproductive branches or the presence or absence of sporophytes. Discharged spores do not ordinarily adhere in tetrads. The growth of the thallus is apical, by means of a "two-faced" apical cell, which gives rise to segments alternately from its right and left cutting faces. The early divisions of the primary segment of the apical cell follow the scheme of Leitgeb (1877). The axial row of the archegonium develops from a mother cell which divides to form a central cell and a neck-canal mother cell; the latter divides once, increasing the axial row to 3 penultimate cells, which divide in acropetal succession forming ultimately an egg, a ventral canal cell, and 4 neck-canal cells. Disintegrating archegonia were numerous in the material here studied, the egg and the ventral canal cell frequently breaking down before the maturity and disintegration of the neck-canal cells. The young embryos show an order of division slightly different from that reported by Miss Clapp (1912). A massive "calyptra" is formed around the sporophyte by the rapid growth and division of the cells of the venter and of the cells of the thallus immediately below the archegonium.—*E. W. Sinnott.*

6487. Steil, W. N. **The antherozoid of the genus Riccardia.** Bull. Torrey Bot. Club 50: 197–201. *5 fig.* 1923.—The antherozoids of *Riccardia pinguis*, *R. multifida*, and *R. palmata* are described and figured. It is shown that the 2 cilia are unequal in length and attached at different points close to the anterior end of the long and slender body. The author makes the statement that "the nature of the cilia of the antherozoid suggests a possible heterokont relationship."—*P. A. Munz.*

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*

Donald S. Welch, *Assistant Editor*

(See also in this issue Entries 6241, 6514, 6520, 6523, 6528, 6530, 6533, 6534, 6542, 6547, 6595, 6612, 6647, 6649, 6657)

FUNGI

6488. Bisby, G. R., and A. H. R. Buller. **Preliminary list of Manitoba fungi.** Trans. British Mycol. Soc. 8: 91–109. 1923.—The list contains 574 fungi: myxomycetes, 34; bacteria, 8; phycomycetes, 20; ascomycetes, 62; imperfect fungi, 38; smuts, 20; rusts, 80; polypores, 63; agarics, 108; Thelephoraceae, 36; other basidiomycetes, 57; and lichens, 48.—*W. B. McDougall.*

6489. B[rooks], F. T. [Rev. of: Gwynne-Vaughan, Dame Helen. **Fungi: Ascomycetes, Ustilaginales, Uredinales.** *ii + 232 p., 196 fig.* Cambridge University Press: 1922 (see Bot. Absts. 11, Entries 2707, 4253).] Trans. British Mycol. Soc. 8: 109–110. 1923. [See also Bot. Absts. 11, Entry 4247; 12, Entry 1968.]

6490. Cunningham, G. H. **A singular Cordyceps from Stephen Island, New Zealand.** Trans. British Mycol. Soc. 8: 72–75. *Fig. 1–3.* 1923.—*Cordyceps Kirkii* is described as new.—*W. B. McDougall.*

6491. Elliott, W. T. **Some observations on the mycophagous properties of slugs.** Trans. British Mycol. Soc. 8: 84–90. 1923.—Observations were made during 4 years using 10 species of slugs and 60 species of fungi. The results, given in tabular form, show that of the 10 species of slugs 3 are extremely partial to fungous food, 1 feeds only on lichens, 1 eats fungi only under compulsion, and the other 5 feed upon fungi as readily as upon various other kinds of food. Fungi that are poisonous to man are not avoided by slugs. Slugs are partial to all species of *Russula* but they refuse tough and hard fungi, such as *Scleroderma vulgare* and *Panus stypticus.*—*W. B. McDougall.*

6492. Fitzpatrick, Harry Morton. **Monograph of the Nitschkieae.** Mycologia 15: 45–67. 1923.—This is a continuation of the study previously noted [see Bot. Absts. 12, Entry 4199.] The 4 remaining genera are described and the following species noted. Under *Calyculosphaeria* nom. nov. (*Winterella Berl.*) *C. calyculus* (Mont.) comb. nov., *C. pezizoidea* (Pat. & Gaill.) comb. nov., *C. collapsa* (Romell) comb. nov., and *C. macrospora* sp. nov. are described; under *Tympanopsis* the species described are *T. euomphala* (B. & C.) Starbäck, *T. coelosphaerioides* Penz. & Sacc., and *T. uniseriata* sp. nov.; under *Thaxteria* the species described are *T. leptosporoides* (Wint.) comb. nov., and *T. didyma* (Speg.) Sacc.; under *Acanthonitschkea* the species *A. argentinensis* Speg. and *A. macrobarbata* sp. nov. are described.—*H. R. Rosen.*

6493. Gäumann, Ernst. **Mykologische Mitteilungen. [Mycological contributions.]** Bull. Jard. Bot. Buitenzorg III, 3: 121–127. *Fig. 1–4.* 1921.—The author describes 3 new species of fungi, *Triphragmium Trevesiae, Gloeosporium tremellinum,* and *Ravenelia Erythrinae,* and gives additional information on *Hamaspora gedeana* Rac.—*Alfred Rehder.*

6494. Gleisberg, W. **Zur Revision der Gattung Pestalozzia de Not. [Contribution to a revision of the genus Pestalozzia.]** Ber. Deutsch. Bot. Ges. 39: 79–83. *Fig. 1.* 1921.—While investigating a species of *Valsa* on *Thuja occidentalis* a species of *Pestalozzia* was found. Study showed that it conforms equally to the descriptions of 3 distinct species of *Pestalozzia* as diagnosed by Saccardo, namely, *P. funeria, P. foedans,* and *P. Conigena.* The plant should be called *P. funeria* because of the priority of this name but this study shows that the diagnosis of species of *Pestalozzia* as given by Saccardo is inadequate and the whole genus is in great need of revision. Attempts to infect living plants of *Thuja* with *P. funeria* were unsuccessful and the fungus is considered a harmless saprophyte.—*W. B. McDougall.*

6495. Lingelsheim, Alexander. **Stilbella Arndtii, ein neuer entomogener Höhlenorganismus aus Schlesien. [Stilbella Arndtii, a new entomogenous cave organism from Silesia.]** Ber. Deutsch. Bot. Ges. 39: 149–151. 1921.—Several fruit-bodies of *Mycena filopes* Bull. were found in caves in Silesia. *Stilbella Arndtii,* found growing upon *Heleomyzae serratae* L., is described as new. This is the first entomogenous species of the genus *Stilbella* to be reported from Central Europe and only 4–5 entomogenous species are known from other parts of the world, most species of the genus having been reported as growing upon plants. It is suggested that further studies may reveal other interesting relations between cave fungi and cave animals.—*W. B. McDougall.*

6496. Murrill, W. A. **Poria Cocos (Schw.) F. A. Wolf.** Mycologia 15: 105–106. 1923.—The author notes a yellowish Poria found associated with a large sclerotium which had been found attached to dead roots of Eucalyptus.—*H. R. Rosen.*

6497. Overeem-de Haas, C. van, und D. van Overeem-de Haas. **Verzeichnis der in Niederländisch Ost-Indien bis dem Jahre 1920 gefundenen Myxomycetes, Fungi und Lichenes.** [Enumeration of the myxomycetes, fungi and lichens collected up to 1920 in the Dutch East Indies.] Bull. Jard. Bot. Buitenzorg **III, 4**: 1–146. 1922.—The authors state that the enumeration is based chiefly on literature which is very scattered and difficult of access and that it is not intended to be critical. The enumeration contains 91 Myxomycetes, 2,232 Fungi, and 503 Lichenes. An index to the literature cited concludes the paper.—*Alfred Rehder.*

6498. Rea, Carleton. **Presidential address. A brief review.** Trans. British Mycol. Soc. **8**: 11–22. 1922.—This paper presents a summary of the main advancements that have been made in mycology since the founding of the British Mycological Society 25 years ago.—*W. B. McDougall.*

6499. Stevens, F. L., and Ruth I. Dowell. **A Meliola disease of cacao.** Phytopathology **13**: 247–250. *Fig. 1–3.* 1923.—At Coverden, British Guiana, a leaf spot of *Theobroma cacao*, due to *Meliola guianensis* n. sp., was found in abundance. The Meliola was in some instances overgrown by *Helminthosporium guianensis* n. sp., and by *Nectria portoricensis* Stev.—*B. B. Higgins.*

6500. Wakefield, E. M. **The Worcester foray.** Trans. British Mycol. Soc. **8**: 1–8. 1922.—This is a report of the 25th annual meeting and foray of the British Mycological Society held at Worcester, Sept. 19–24, 1921. A complete list of the fungi collected, numbering about 435 species, is given.—*W. B. McDougall.*

6501. Weese, J. **Über die Gattungen Ophiosphaeria W. Kirschst., Acanthophiobolus Berl. und Ophiochaete Sacc.** [On the genera Ophiosphaeria, Acanthophiobolus, and Ophiochaete.] Ber. Deutsch. Bot. Ges. **39**: 114–120. 1921.—The relationships and synonymy of the 3 genera are fully discussed. It is concluded that with a proper rearrangement of species the genera *Ophiosphaeria* and *Acanthophiobolus* should be retained while *Ophiochaete* should be relegated to synonymy.—*W. B. McDougall.*

6502. Weese, J. **Über einige Ascomyceten aus dem Mahrischschlesischen Gesenke.** [On some Ascomycetes from Silesia.] Ber. Deutsch. Bot. Ges. **39**: 108–113. 1921.—*Nectria tricolor* Höhnel is discussed and described in detail. *Epicymatia episphaerica* Niessl is found to be identical with *Berlesiella parasita* (Fabre) Höhnel, and *Meliola sudelica* Niessl is believed to be identical with *M. nidulans* (Schweinitz) Cooke.—*W. B. McDougall.*

6503. Wollenweber, H. W. **Zur Systematisierung der Strahlenpilze. (Gattung Actinomyces Harz.)** [The systematic arrangement of the radiating fungi. The genus Actinomyces Harz.] Ber. Deutsch. Bot. Ges. **39**: 26–30. 1921/1922.—The genus is divided into 5 sections: the 1st sclerostroma, distinguished from the others by the presence of sclerotia; the others separated on the basis of the color of the conidia. In the 2nd section, poliophaeospora, the conidia are gray to brown; in the 3rd, leucospora, white, yellowish or greenish white; in the 4th, erythrinospora, red or reddish, and in the 5th, glaucospora, blue. Most of the species belong to the section leucospora and this section is further subdivided.—*W. B. McDougall.*

LICHENS

6504. Knight, H. H. **Lichens found during the Worcester Foray.** Trans. British Mycol. Soc. **8**: 10. 1922.—A list is given of 46 species of lichens collected during the Worcester Foray, Sept. 21–24, 1921.—*W. B. McDougall.*

6505. Lindau, G. **Lichenes novo-guineenses.** Bot. Jahrb. **58**: 250–254. 1923.—This is No. 84 of Series X of the Beiträge zur Flora von Papuasien. Ledermann's collection, so rich in phanerogams, furnished no new species of lichens. Thirty-one species in 18 genera are listed, accompanied by notes on distribution.—*K. M. Wiegand.*

6506. Riddle, Lincoln W. **The lichens of the Isle of Pines.** Mycologia 15: 68–88. *Fig. 1.* 1923.—A list is given of 127 species in 49 genera, "of which 1 genus, 14 species, and 1 variety are new. Of the new species, 11 grow on rocks." A Latin description is given for every new form. The new genus, **Monoblastia**, belongs to the family Pyrenulaceae. The new species are: *Thrombium echinulosporum, Microglaena Brittonii, Monoblastia palmicola, Porina macrocarpa, P. subfirmula, P. Wilsonii, Opegrapha oleagnea, Leptotrema polyporum, Phyllospora cryptocarpa, Anema bullata, Blastenia Brittonii* Zahlbr., *Buellia Brittoniae, B. flavogranulosa,* and *B. subdispersula.* The new variety is *Opegrapha lithyrga* var. *notha.* The following new combinations occur: *Microglaena scopularis* (Wainio), *Phylloporina dilatata* (Wainio), *Ocellularia subtilis* (Tuck.), *Leptotrema simplex* (Tuck.), *Bacidia microphyllina* (Tuck.), *Bilimbia Sprucei* (Muell. Arg.), *Phyllopsora isidiotyla* (Wainio), and *Thyrea cubana* (Tuck.).—*H. R. Rosen.*

BACTERIA

6507. Crow, W. B. **The structure and affinities of Leuconostoc mesenteroides (Cienkowsky) Van Tieghem.** Trans. British Mycol. Soc. 8: 76–84. *Fig. 1–2.* 1923.—*Leuconostoc mesenteroides,* which occurs most commonly as gelatinous masses in vats in sugar beet factories, is discussed in detail from cultural, structural, and microchemical points of view. The conclusion is reached that *Leuconostoc* is not closely related to any of the algae but is allied to certain bacteria and should be provisionally placed in the Coccaceae.—*W. B. McDougall.*

6508. Frobisher, Martin, Jr. **A comparative study of media for the quantitative estimation of bacteria in milk.** Amer. Jour. Public Health 13: 474–478. 1923.—The media studied were the medium of the American Public Health Association, lactose agar, milk-powder agar, milk-powder-yeast agar, and milk-powder agar with the addition of 1 per cent lactose. "The milk-powder agar and lactose agar are apparently the media of preference for routine work." All enriched media gave a higher count of larger, more uniform colonies than the standard medium. There was also less variation in counts by different individuals and more opportunity for differentiation of species.—*C. A. Ludwig.*

6509. Gicklhorn, Jos. **Zur Morphologie und Mikrochemie einer neuen Gruppe der Purpurbakterien.** [**On the morphology and microchemistry of a new group of the sulphur bacteria.**] Ber. Deutsch. Bot. Ges. 39: 312–319. 1921.—Two new species of sulphur bacteria are described. They are peculiar in containing, together with sulphur, large quantities of calcium carbonate, up to 60 per cent of the total volume. They are: *Chromatium Linsbaueri* n.sp. and *Rhabdochromatium Linsbaueri* n.sp. The author places them in the group "lime bacteria."—*S. F. Cook.*

MYXOMYCETES

6510. Lister, G. **List of Mycetozoa found during the Worcester Foray.** Trans. British Mycol. Soc. 8: 8–9. 1922.—After brief mention of some of the more important finds, a list of 38 species of Myxomycetes collected during the Worcester Foray, Sept. 19–23, 1921, is given.—*W. B. McDougall.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

Edward W. Berry, *Editor*

(See also in this issue Entries 6251, 6457, 6480, 6481, 6593, 6647, 6683, 6694)

6511. Collins, G. N. **An ear of prehistoric maize that resembles the fossil form, Zea antiqua.** Jour. Heredity 14: 61–64. *2 fig.* 1923.—The ear was found by Colonel John W. Gulick, in a prehistoric grave near Arica, Chile. The "Arica ear" is somewhat smaller than the fossil ear described by Knowlton, but presents practically the same characteristics. The grains are arranged in approximately 20 rows, and although quite small they contain true

starch, unlike the majority of small-grained varieties today. The ear does not throw much light on the origin of maize, but it does show that nearly all the steps in developing maize as we know it today were taken at least as early as the time of the "Arica ear."—*R. C. Cook.*

6512. Conwentz, H. **Über zwei subfossile Eibenhorste bei Christiansholm, Kreis Rendsberg.** [Two subfossil yews at Christiansholm.] Ber. Deutsch. Bot. Ges. 39: 384–390. 1921.—The occurrence of the yew is noted outside the present range in prehistoric time. Boles and stumps of a pine-yew-oak forest floor were earlier noted at a depth of 1 m. in sphagnum turf of lowlands of Hannover, where only a single pair of wild trees is now known. Yew wood was much used in the prehistoric wooden utensils from Jütland, Seeland, Fünen, and Bornholm. Old or sub-geologic forests of oak, yew, and other trees are found near the surface of the sandy soil about Christiansholm. Quite recent, marked restriction of the yew is indicated. Some of the material is charred.—*G. R. Wieland.*

6513. Hollick, Arthur. **The taxonomic and morphologic status of Ophioglossum Alleni Lesquereux.** Bull. Torrey Bot. Club 50: 207–213. *Pl. 10–12.* 1923.—The fossil plant from the shales of Florissant, Colorado, originally described by Lesquereux as *Ophioglossum Alleni* and later referred by him to *Salvinia*, has also been placed under the following genera: *Tmesipteris*, *Carpolithes*, *Phyllites*, and *Brachyruscus*, the last named genus being in the Spermatophyta. The present paper gives data to show that *Carpolithes Alleni* (Lesquereux) Cockerell is "properly applicable."—*P. A. Munz.*

6514. Мейер, К. И. [Meyer, K. I.] **Происхождение наземной растительности. [The origin of the land vegetation.]** *75 p., 60 fig.* Государственное издательство, Москва. [Edition of the State, Moscow.] 1922.—In this book by a Russian liverwort specialist, there is an exposition of the change of generations and origin of land flora; also the views of Pringsheim, Celakovsky, Bower, Potonie and Davis, and modern data of change of generations in cellular plants are considered. The author examines the present status of the question of the origin of land vegetation and gives a theoretical characterization of the ancestor of land plants. This ancestor is an alga, showing a dichotomous branching of thallus, with homotypical Dictyota-type-alternation of generations. The gametophyte produces a gametangium having the character of a many-chambered sporangium. The other generation—the sporophyte—has sporangia or, it is possible, tetrasporangia. The author tries to represent a possible way of evolution, which the alga-type, mentioned above, followed when it became terrestrial. Both the Bryophyta and Pteridophyta have developed from the same prototype, but their ways of evolution diverged at the very beginning and this has brought about the principal difference between them. The author represents the hypothetical ancestor of the Bryophyta—the Protosphaerocarpus. It is like a sphaerocarpus, but without sexual differentiation in the thallus, with antheridia and archegonia on the same thallus. This type has left the water. The many-chambered sporangia were transformed according to Davis' theory, into the antheridia and archegonia. The bryophyte sporangium is a total generation, the rest of the sporophytic thallus. The first phase of the phylogenetical branch, Pteridophyta-Gymnospermae-Gyneciatae, is the transformation of the dorsiventral thallus in the radial vertical shoot. The evolution of this branch has proceeded under the influence of factors established by Bower.—*V. Lashevsky.*

6515. Metcalf, W. **An ancient pine cone.** Amer. Forest. 29: 172. *1 fig.* 1923.—A cone from a Knobcone pine estimated to have been buried in the ground for 40–50 thousand years is compared with the cone of the same species of today.—*Chas. H. Otis.*

PATHOLOGY

Frederick V. Rand, *Editor*

Lillian C. Cash, *Assistant Editor*

(See also in this issue Entries 6152, 6156, 6182, 6193, 6202, 6217, 6241, 6247, 6248, 6262, 6269, 6271, 6297, 6305, 6316, 6365, 6378, 6387, 6391, 6426, 6430, 6447, 6455, 6471, 6476, 6488, 6489, 6490, 6491, 6494, 6495, 6497, 6498, 6499, 6503, 6612, 6613, 6617, 6635, 6636, 6639, 6642, 6694, 6696, 6726, 6733, 6734, 6736)

DISEASES CAUSED BY FUNGI

6516. Anonymous. **Pine blister disease in Europe.** Amer. Forest. 29: 244. 1923.—This is an interview with Perley Spaulding concerning his 8-months' study of blister-rust conditions in Europe. The disease has been known in Switzerland since 1854, but has become widely destructive only within the last 10 years. The black currant, almost universally cultivated, is the most susceptible and dangerous host in both Europe and America.—*Chas. H. Otis.*

6517. Anonymous. **Report of the proceedings and recommendations of the eighth annual blister rust conference held in Boston, Massachusetts, Feb. 8–10, 1923.** *126 p. (mimeographed).* 1923.—This report comprises discussions by various investigators as to "our object and its attainment," State, Federal, and Canadian policies as regards white pine blister rust, educational work, problems of blister rust agents, scientific investigations, and 7 special papers. [A full report of the preceding conferences was never published or mimeographed. A résumé of most of them will be found in The American Plant Pest Committee Bull. 2, 4, and 6 covering the years 1918–1920 (see Bot. Absts. 3, Entries 393, 396, 409, 411, 416, 417; 7: 1140, 1203, 1224, 1246; 10: 1277, 1307); in the bulletin on white pine blister rust published by the Committee on Suppression of the White Pine Blister Rust in North America, covering the year 1917 [1918]; and in New York Conservation Commission Bull. 15, entitled "The pine blister," by B. H. Paul, covering the year 1916. No blister rust conference was held in 1921 or 1922].—*Frederick V. Rand.*

6518. Anonymous. **Studies on Phytophthoras.** [Rev. of: (1) Bruyn, Helena L. G. de. **The saprophytic life of Phytophthora in the soil.** Mededeel. Landbouwhoogeschool Wageningen 24[4]: 4–37. *8 fig.* 1922. (2) Löhnis, M. P. **Onderzoek over Phytophthora infestans (Mont.) de By. op de aardappelplant.** H. Veenman: Wageningen, 1922 (see Bot. Absts. 12, Entries 1241, 4270).] Nature 111: 305. 1923.—The former contains no information "as to whether *P. infestans* was found to live and grow in unsterilized soil; and speculation as to whether the survival of this fungus in the soil from season to season may account for primary outbreaks of potato blight seems altogether too premature."—*O. A. Stevens.*

6519. A., S. F. **The Sclerospora disease of sugar-cane in Formosa.** Agric. News [Barbados] 20: 382–383. 1921.—Downy mildew of sugar-cane (*Sclerospora Sacchari* Miyake) is described as to history, symptoms, the parasite, injury caused, other crops affected, and control. [Cf. also Agric. News 21: 79. 1922; and, Sugar 24: 619. 1922.]—*Frederick V. Rand.*

6520. Bourne, B. A. **Researches on the root disease of sugar cane.** Rept. Dept. Agric. Barbados. *17 p., 5 pl.* [1922?].—This disease is not confined to any type of soil. With existing agricultural methods plant canes do not appear to be seriously attacked, but ratoon canes seem to be especially susceptible under certain conditions. *Rhizoctonia Solani* and *R. pallida* have both been found associated with newly infected and dying cane roots in typical cases of root disease and also in advanced stages of the disease, and both fungi have been proved by inoculation tests to cause typical root disease. Inoculations with *Marasmius Sacchari* and with *Fusarium* sp. have invariably given negative results. Furthermore, *Marasmius Sacchari* has never been isolated from freshly diseased and dying cane roots, only from dead

roots.—Cultural characters of the 2 species of *Rhizoctonia* are given.—Recommendations for control comprise the use of resistant varieties and healthy cuttings from plants free of disease, proper crop rotation, tillage and drainage, and proper "trashing" of fields of young plant and ratoon canes to conserve soil moisture and to keep down the temperature.—*Frederick V. Rand.*

6521. Brisley, Harold Roy. **Studies on the blight of cucurbits caused by Macrosporium cucumerinum E. & E.** Phytopathology 13: 199–204. *Fig. 1–3.* 1923.—This leaf blight has recently produced serious damage to the cantaloupe [*Cucumis melo* L.] crop in Arizona. The first noticeable evidence of the disease on leaves is a small tan-colored spot the size of a pin head at the point of infection. The spots enlarge until they coalesce and kill the entire leaf. The older spots are made up of concentric dark and lighter colored rings, with always the lighter center. A fruit rot is also produced on over-ripe fruits on diseased vines. Infections were produced by artificial inoculations on leaves of cantaloupe, squash, watermelon, cucumber, Irish potato, and tomato. Apparently the parasite is carried through the winter by the mycelium in dead plant tissue.—*B. B. Higgins.*

6522. Bryce, G. **The toxicity of lime to Fomes lignosus Klotsch.** Dept. Agric. Ceylon Bull. 64. *17 p.* 1923.—*Fomes lignosus* is the causative organism of a serious root disease of para rubber (*Hevea brasiliensis*). The results obtained demonstrate that quicklime applied to the soil has little fungicidal value for *Fomes lignosus.*—*E. D. Merrill.*

6523. Chupp, Charles, and Grace L. Clapp. **Fusicoccum canker on apple.** Phytopathology 13: 225–230. *Pl. 12.* 1923.—An apparently new canker disease of apple trees was found on nursery stock in storage at Newark, New York. Black cankers appeared at or near the bud union and occasionally further up the stem. Isolations from canker tissue gave a species of *Fusicoccum* capable of reproducing the disease. The fungus, after comparison with specimens and descriptions of similar pycnidial fungi, is considered a new species and is here described as *Fusicoccum Pyrorum.* It does not seem to be very actively parasitic. In every case observed, affected trees have been in a weakened condition previous to infection.—*B. B. Higgins.*

6524. Clayton, Edward E. **The relation of soil moisture to the Fusarium wilt of the tomato.** Amer. Jour. Bot. 10: 133–147. *Pl. 13–15.* 1923.—Tomato plants were grown in crocks of sterilized soil inoculated with a spore suspension of *Fusarium Lycopersici* Sacc. By weighing, in certain cases, and by the auto-irrigator, in others, the soil was held at moisture contents of 13–35 per cent, the latter value representing complete saturation. Plants growing in soil with a low moisture content (13–19 per cent) became infected readily but were very resistant, the disease progressing slowly. Those grown in saturated soil were entirely immune to attack, infection never taking place. This immunity seems to be related to the almost complete absence of nitrates in the tissues of the host plant under these conditions. Vigorous, rapidly growing plants, produced when soil moisture was optimum for growth, were attacked vigorously, but these could be rendered disease-resistant by allowing the soil to become very dry. Plants soon lost their resistance or immunity when the moisture content of the soil became such as to stimulate vigorous growth.—*E. W. Sinnott.*

6525. Czarnecki, Helen. **Studies on the so-called black heart disease of the apricot.** Phytopathology 13: 216–224. *Pl. 11, fig. 1–4.* 1923.—A new disease of apricots [*Prunus armeniaca* L.] and of almonds [*Prunus amygdalus* Stokes] is reported from California. The disease is characterized by a sudden wilting of the leaves, the only external symptom, and by the the blackening of the heart wood. It usually appears first in June when its presence is manifested by a sudden wilting at the tip of 1 or more branches. The wilting spreads back and the entire tree is soon killed. The disease is most common on young trees. Many isolations from diseased wood from various localities have shown the constant association of a species of *Verticillium;* and inoculations of this fungus into healthy trees have reproduced the disease.—*B. B. Higgins.*

6526. Detmers, Freda. **Dothichiza canker on Norway poplar.** Phytopathology 13: 245–247. *Pl. 13.* 1923.—A canker of Norway poplar (*Populus Eugenei* Simon-Louis) caused by *Dothichiza populea* Sacc. & Briard is here recorded for the 1st time, though cankers produced by this fungus are common on other species of poplar. In a large planting of Norway poplar in Ohio the young trees were so badly damaged that they were dug up and burned.—*B. B. Higgins.*

6527. Dickson, James G. **Influence of soil temperature and moisture on the development of the seedling blight of wheat and corn caused by Gibberella Saubinetii.** Jour. Agric. Res. 23: 837–870. *Pl. 1–6 (1 and 2 col.), fig. 1–15.* 1923.—*Gibberella Saubinetii* causes a seedling blight of both maize [*Zea*] and wheat [*Triticum*]. The disease develops from infected seed, scabbed seed in the case of wheat, and from infested soil. It appears (1) as a blight of the seedlings prior to emergence from the soil (commonly spoken of as poor germination), (2) as a blight after emergence with resulting yellow and wilted seedlings, and (3) as a dwarfing of the seedlings due to weakened root systems. The extent of blighting is in direct proportion to the amount of infestation, environmental factors being equal. The most important environmental factor in determining seedling blight is soil temperature. The pathogen in pure culture has a wide temperature range of growth, varying from 3 to 32°C. The optimum temperature for spore germination, vegetative development, and sporulation is about 24°C. on unacidified media, and 28°C. on acidified media. Wheat develops best at low soil temperatures while maize develops best at high soil temperatures. The most favorable soil temperature for the blighting of wheat ranges from 12 to 28°C., below which blighting seldom occurs. The most favorable soil temperature for the blighting of maize ranges from 8 to 20°C., while above 24°C. no blighting occurs. Low moisture is most favorable for blight of wheat, even at low soil temperatures. Results of experiments in sowing maize and wheat in the field at various dates, and recording soil moisture and temperature are in accord with the above results obtained in the greenhouse. The mean daily soil temperature in the field corresponds to the constant soil temperature in the greenhouse. There is a sharp critical temperature for both the blight of maize and wheat. This is between 20 and 24°C. for maize and about 12°C. for wheat. The seedlings become susceptible to the pathogen when they are unable to respond favorably to the environment.—*W. H. Burkholder.*

6528. Dowson, W. J. **Contributions from the Wisley Laboratory. XLI.—The wilt disease of Michaelmas daisies.** Jour. Roy. Hort. Soc. 48: 38–57. *Fig. 11–18.* 1923.—The cause of this disease was found to be a fungus of the genus *Cephalosporium* working in the water conducting tissue. It produces a toxic substance which causes yellowing and dying of the leaves. Control of the disease is based on experimental results showing that (1) healthy plants may be grown from suckers taken from diseased stock; (2) the disease rarely kills plants the 1st season; and (3) the fungous mycelium is localized in the base of the plant during spring and early summer and does not occur in the suckers. A technical description of the causal organism, *Cephalosporium Asteris* n. sp., is given, followed by a list of 13 references to literature.—*J. S. Bailey.*

6529. Earle, F. S. **Sugar cane root disease. A neglected enemy of cane and ways of controlling it.** Facts about Sugar 16: 314. 1923. [See Bot. Absts. 11, Entry 2867.]

6530. Faris, James A. **Anthracnose of the Boston fern.** Mycologia 15: 89–95. *Pl. 8–9.* 1923.—From brown, withered tips of *Nephrolepis exaltata* growing in the Brooklyn Botanic Garden, a fungus was obtained in pure culture which when inoculated on healthy fronds produced the same symptoms. A description of both an imperfect (*Colletotrichum*) stage and a perfect (*Glomerella*) stage of the fungus is given. It is tentatively named *Glomerella Nephrolepis* sp. nov. Control measures are given.—*H. R. Rosen.*

6531. F[yson], P. F. [Rev. of: Sundararaman, S. **Helminthosporium disease of rice.** Agric. Res. Inst. Pusa Bull. 128. *7 p., 4 pl. (2 col.).* 1922 (see Bot. Absts. 12, Entry 6546).] Jour. Indian Bot. 3: 155. 1923.

6532. F[yson], P. F. [Rev. of: Sundararaman, S. **The coconut-bleeding disease.** Agric. Res. Inst. Pusa Bull. 127. *8 p., 6 pl. (1 col.).* 1922 (see Bot. Absts. 12, Entry 6547).] Jour. Indian Bot. **3**: 155. 1923.

6533. Gaines, E. F., and F. J. Stevenson. **Occurrence of bunt in rye.** Phytopathology **13**: 210–215. *Fig. 1–2.* 1923.—*Tilletia Tritici* has been found occurring naturally in a few heads of Rosen rye (*Secale cereale* L.) and in wheat × rye hybrids. Artificial inoculations of seed of 9 varieties of rye showed 5 entirely immune. The other 4 produced some infected heads. The wheat × rye hybrids were much more susceptible. Spores from the smutted rye were much less virulent on wheat than were spores from wheat; and they failed to produce any infection on rye. It is suggested that *Tilletia Tritici* (Bjerk.) Wint. and *T. secalis* (Cda.) Kühn. are in reality the same fungus.—*B. B. Higgins.*

6534. Hungerford, Chas. W. **A Fusarium wilt of spinach.** Phytopathology **13**: 205–209. *Fig. 1–4.* 1923.—A root rot and wilt of spinach [*Spinacia oleracea* L.], first noted at Moscow, Idaho, in 1919, is attributed to *Fusarium Spinaciae* n. sp. The leaves become pale yellow, the edges roll inward and die, and the entire plant succumbs within 2–3 weeks. Most of the fine fibrous roots of such plants are decayed. The vascular tissues in the main root and in the base of the stem are darkened.—*B. B. Higgins.*

6535. Jones, L. R., and J. C. Walker. **Yellows-resistant cabbage varieties. Some necessary precautions for seedsmen to consider in the production and distribution of seeds of new special strains.** Seed World **13**[3]: 20–21. *1 fig.* 1923.

6536. Lansing, K. H. **Discovers how to control lettuce "drop" (Sclerotinia libertiana). Formaldehyde treatment of seed beds found to be a very effective method of control.** Seed World **12**[9]: 20. *2 fig.* 1922.—This control treatment including methods of application is made possible through the research work of W. S. Beach and is here briefly described.—*Frederick V. Rand.*

6537. Lee, H. Atherton. **A disease of Satsuma and Mandarin orange fruits caused by Gloeosporium foliicolum Nishida.** Philippine Jour. Sci. **22**: 603–615. *Pl. 1 (col.), 1 fig.* 1923. —A general discussion of the disease and the causative organism is presented. In Japan it has been observed to cause a loss of 20 per cent of the crop of the Wase Unshiu variety of orange. It seems to be confined to this one variety, but inoculation experiments have shown that at higher temperatures it affects other varieties of the Unshiu and the Mandarin oranges.—*E. D. Merrill.*

6538. Lee, H. Atherton, and F. B. Serrano. **Banana wilt of the Manila hemp plant.** Phytopathology **13**: 253–256. 1923.—A heart rot of Manila hemp plant (*Musa textilis* Neé) is produced by a Fusarium, apparently identical with *F. cubense* E. F. Smith. The fungus was readily isolated from tissue in early stages of decay, and in 1 series of 134 inoculations produced 66.41 per cent infections. A similar rot was produced in hemp plants inoculated with *Fusarium* from wilted banana plants. A comparison of the 2 organisms showed them to be similar morphologically and in cultural characters.—*B. B. Higgins.*

6539. Liese, I. **Neue Beobachtung über Cenangium abietis Pers. [Recent observations on Cenangium abietis.]** Zeitschr. Forst.- u. Jagdw. **54**: 227–229. *1 fig.* 1922.—Under favorable conditions this saprophytic fungus attacks and kills young shoots of pine, gaining access through the buds. In this particular case, 1-year-old Scotch pine (*Pinus silvestris*) in a nursery in the forest range of Koppelsburg, Pomerania, was attacked. The disease manifested itself by the dying-off of the stem and leaves immediately below the terminal bud, and included the upper $\frac{1}{3}$ of the tree. Previous opinion commonly considered that only pines over 5 years of age were subject to attack. In general, the trees attacked recovered, and the disease may be considered as a temporary one, causing little destruction.—*J. Roeser.*

6540. Line, J. **The parasitism of Nectria cinnabarina (coral spot) with special reference to its action on red currant.** Trans. British Mycol. Soc. 8: 22-28. *Pl. 1.* 1922.—*Nectria cinnabarina* is ordinarily not capable of infecting living portions of a red currant (*Ribes vulgare*) plant directly. It may occasionally gain entrance through wounds but the normal method of attack is by spreading through the wood cells from a dead portion into healthy wood. Injury is due to clogging of the wood cells by the fungus hyphae thus causing wilting and subsequent death of the parts above.—*W. B. McDougall.*

6541. [McCallan, E. A.] **Snapdragon rust.** Agric. Bull. Bermuda Dept. Agric. 2[6]: 7. 1923.—A call is made for cooperation in eradicating the pathogen [*Puccinia Anterrhini*], and a plan of operation is outlined.—*H. H. Whetzel.*

6542. Milbrath, D. G. **Downy mildew on lettuce in California.** Jour. Agric. Res. 23: 989–993. *Pl. 1–3.* 1923.—California conditions, especially in the winter months, are very favorable for the development of *Bremia Lactucae* on lettuce [*Lactuca*] and the mildew is widespread in the areas of commercial production. Affected heads do not stand shipment and storage as well as healthy ones.—The variety New York, which is most commonly grown, is very susceptible to the disease, while Iceberg, Big Boston, and Hanson are resistant.—During the cool months, December–March, and at a temperature of 10°C., conidia of *B. Lactucae* commonly germinate by means of swarm spores.—*D. Reddick.*

6543. Munn, M. T. **Further studies of the fungous associates of germination tests.** Proc. Assoc. Official Seed Analysts North America 1920: 57–59. 1921.—The amount of moldiness, or fungous infestation, of seeds as shown in germination testing depends upon conditions of harvesting, character of the seed coat (whether smooth or rough), and the condition of the substratum used (whether sterile or foul with inert material and inoculum). The older and weaker the seeds the more subject they seem to be to attacks of fungi, being unable in many cases to germinate satisfactorily. Certain cases of low germination could be definitely traced to unsatisfactory conditions of weather and methods at the time the seeds were harvested, these facilitating bacterial and fungal infestation. Methods of seed treatment and the use of various chemicals and disinfectants need to be carefully reinvestigated before it will be safe and desirable to use them as an aid in measuring the viability of seed.—*M. T. Munn.*

6544. Passy, Pierre. **Sur la gale des poires.** [Pear scab.] Rev. Hort. 94: 71–72. *Fig. 21–25.* 1922

6545. Scilley, H. **Leaf spot of sugar beets.** Facts about Sugar 14: 500–501. 1922.—The leaf spot of sugar beets [*Cercospora beticola*] caused considerable loss in northern Colorado in 1921. Usually there is less loss in the northern part of the state than in the southern on account of the altitude and temperature. The disease does not develop below 70°F. Rotation of crops and later planting are advised as preventive measures.—*C. W. Edgerton.*

6546. Sundararaman, S. **Helminthosporium disease of rice.** Agric. Res. Inst. Pusa Bull. 128. *7 p., 4 pl. (2 col.)* 1922.—Disease signs on the leaves consist of small spots with brownish centers bearing smoky black dots made up of spores and hyphae. These spots coalesce and sometimes the whole leaf withers, turns yellowish, and dries up. Continued rains and moist weather favor the spread of the disease. The nodes and glumes are also sometimes attacked. Microscopical examination, cultural and spore-germination studies, and inoculation experiments with this undetermined species of *Helminthosporium* are given. The fungus is said to be a weak parasite, and under normal conditions there is no serious loss of crop. [See also Bot. Absts. 12, Entry 6531.]—*Frederick V. Rand.*

6547. Sundararaman, S. **The coconut-bleeding disease.** Agric. Res. Inst. Pusa Bull. 127. *8 p., 6 pl. (1 col.)* 1922.—The first external sign of disease consists in the oozing out of

a dark reddish brown fluid from cracks in the stem of an affected plant. This fluid turns black and dries. The tissue below decays and turns yellow, and later the whole internal tissue rots, no fruit is borne, the crown dwindles in size and the tree finally dies. The causal fungus, *Thielaviopsis paradoxa*, is described, and inoculation experiments and preventive measures are discussed. [See also Bot. Absts. 12, Entry 6532.]—*Frederick V. Rand.*

6548. Toole, E. H. **Mould prevention in seed germinators.** Seed World 11[1]: 15. 1922.—Moldy seeds probably result from the growth of fungi introduced with the seed indicating that unfavorable conditions existed during the harvesting or early storage of the seed. Moldiness may or may not affect viability of seeds. Special attention should be given to seed-borne parasites. The laboratory and germinator should be kept free of old seed or other material which may supply mold spores. The germination chamber should be sterilized when there is a tendency for all samples to mold. As low a temperature for germination should be employed as the requirement of the seed will permit. If it becomes necessary to treat the seeds with chemicals before germination extreme care must be exercised. Complete sterility must be sacrificed to avoid seed injury.—*M. T. Munn.*

6549. Vollersten, Conrad. **Some facts about blight.** Amer. Nut Jour. 17: 30–31. 1922.—None of the filbert varieties are immune to blight, but some European varieties show resistance. Blight can probably be controlled by cutting affected parts.—*E. L. Overholser.*

6550. Walker, J. C. **The hot water treatment of cabbage seed.** Phytopathology 13: 251–253. 1923.—The results of several experiments indicate that cabbage seed infested with *Phoma lingam* (Tode.) Desm. may be completely freed of the fungus by treating 30 minutes with hot water at 50°C. Some injury to germination may be expected, depending upon the age and vigor of the seed.—*B. B. Higgins.*

DISEASES CAUSED BY BACTERIA

6551. Lutman, B. F. **Potato scab in new land.** Phytopathology 13: 241–244. 1923.—Several experiments are described in which clean potatoes [*Solanum tuberosum*] were disinfected and planted in new soil at the Vermont Experiment Station. In every case some scab developed. Poured agar-plate cultures from this new soil developed quantities of organisms of the *Actinomyces chromogenus* type. The results indicate the general occurrence of the organism in soils where potatoes have never been grown. It is believed that the organism is generally saprophytic on cellulose matter in the soil and that the parasitism on potatoes is merely secondary.—*B. B. Higgins.*

6552. Matz, Julius. **La gomosis de la caña.** [Gummosis of sugar cane.] Sugar 24: 352–354. 1922.—This is a popular description of gummosis (*Bacterium vascularum*) with methods of control. A list showing the resistance or susceptibility of different varieties is included.—*C. W. Edgerton.*

6553. Matz, Julius. **The gumming disease of sugar cane.** Facts about Sugar 15: 258–259. 1922.—The gumming disease of sugar cane, caused by *Bacterium vascularum*, is spreading rapidly in Porto Rico. It is especially common on the Otaheite variety. Some other varieties are resistant or immune. It is advised that the Otaheite variety be avoided.—*C. W. Edgerton.*

6554. Sanford, G. B. **The relation of soil moisture to the development of common scab of potatoe.** Phytopathology 13: 231–236. *Fig. 1–3.* 1923.—During 2 years, potatoes[*Solanum tuberosum* L.] were grown in scab (*Actinomyces scabies*)-infested soil containing various degrees of moisture. During the 2nd year the H-ion concentration of the soil was determined at intervals. The results indicate that the moisture content of the soil is of greater importance than the H-ion concentration. Potato tubers grown in soil with a high moisture content were free from scab, while those grown in comparatively dry soil were badly scabbed, although the H-ion concentration was greater in the dry soil.—*B. B. Higgins.*

DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

6555. Anonymous. **The Rhododendron bug. (Leptobyrsa (Stephanitis) rhododendri, Horv.)** Jour. Ministry Agric. (London) **29**: 555–558. *1 pl.* 1922.—This insect is found upon Rhododendrons and in the U. S. A. on species of *Kalmia*. The obvious signs consist of chocolate-brown spots on the lower and a pale "freckling" on the upper leaf surface. The life-history, methods of control, and administrative measures are discussed.—*Frederick V. Rand.*

6556. Brock, J. A. **The principal foes of the sugar beet crop and their control. III. Sugar beet nematode.** Facts about Sugar **15**: 118–119. 1922.—This is a popular discussion of the nematode, its effect upon the beet, and methods of control.—*C. W. Edgerton.*

6557. Bryce, G. **Experiments with the green muscardine fungus on Rhinoceros beetle larvae.** Dept. Agric. Ceylon Bull. 65. *7 p.* 1923.—The green muscardine fungus (*Metarrhizium anisopliae* (Metch.) Sor.) is apparently not strongly pathogenic to rhinoceros beetle larvae. The fungus seems to be effective only on larvae that have been in captivity for a considerable period, and have accordingly suffered to some extent a reduction in vitality. The use of the fungus as a means of controlling the rhinoceros beetle on coconuts is therefore not recommended.—*E. D. Merrill.*

6558. Docters van Leeuwen, W. **Some galls from Hongkong.** Bull. Jard. Bot. Buitenzorg **III, 4**: 268–278. *Fig. 1–20.* 1922.—Thirty-four galls collected on various plants near Hongkong are described and 20 of them figured.—*Alfred Rehder.*

6559. Docters van Leeuwen, W. **The galls of the islands of the Krakatau group and of the Island of Sebesy.** Bull. Jard. Bot. Buitenzorg **III, 4**: 288–314. *Fig. 1–20, map.* 1922.—The author describes 82 galls collected on several small islands situated between Java and Sumatra which were completely devastated in 1883 by a volcanic eruption.—*Alfred Rehder.*

6560. Docters van Leeuwen, W. **Ueber einige von Aphiden an Styrax-Arten gebildete Gallen. [Galls caused by aphids on species of Styrax.]** Bull. Jard. Bot. Buitenzorg **III, 4**: 147–162. *Pl. 1, fig. 1–16.* 1922.—Eighteen different galls caused by aphids on various species of *Styrax* are described and most of them are figured.—*Alfred Rehder.*

6561. [Easterby, H. T.] **Bureau of Sugar Experiment Stations. Combating insect pests.** [Report of E. Jarvis at Meringa.] Australian Sugar Jour. **15**: 148–150. 1923.—Satisfactory progress in experiments with paradichlorobenzine for control of cane grubs was obtained in plots at Greenhills, where first ratoons (Badilla) were treated with ¼ ounce injections placed 1 foot apart, 2 inches from stools and 4½ inches deep on each side of rows. The cane was 4½ feet high at the time of application. These experiments were made successfully, also, at Meringa, using D. 1135 first ratoons growing on volcanic soil infested with grubs. Exchanges of grub parasites have been made with Java. Cocoons of the Australian digger-wasp, *Campsomeris tasmaniensis* and *C. radula*, have been sent which are to control the ravages of scarabaeid grubs,—*Lepidiota stigma* Fab. and *Leucopholis rorida* Fab.,—affecting cane and cassava crops. In exchange there will be sent 2 species of scoliid parasites from Java, for introduction into the cane fields to attack grubs of the grey-back cane beetle and of *Lepidiota frenchi*.—In Lower Burdekin successful field demonstrations have been made with carbon bisulphide as a soil fumigant for "white ants" attacking cane. [Cf. also: Jarvis, Edmund. **Work of the Division of Entomology.** Ann. Rept. Bur. Sugar Exp. Sta. [Brisbane] **22**: 52–56. 1922.]—*C. Rumbold.*

6562. Flint, W. P. **Shall we change our recommendations for San Jose scale control.** Jour. Econ. Entomol. **16**: 209–215. 1923.—During the years of 1920–1922, inclusive, the San Jose scale, *Aspidiotus perniciosus*, has increased very rapidly in southern Illinois and neighboring states. In southern Illinois it has resulted in the loss of over 1,000 acres of commercial orchard annually treated with lime sulphur.—Experimental work was carried out in the spring

of 1922 with miscible oil and lubricating oil emulsion, similar to those used by the Federal Bureau of Entomology in Florida. The lubricating oil emulsion gave nearly as good control of the scale as did the miscible oil and a much higher degree of control than was obtained from the best grades of liquid lime sulphur. As a result of this work the lubricating oil will be generally used in southern Illinois during the coming year.—*Author's abstract.*

6563. Franchini, G. **Essais d'inoculation de latex parasités aux souris blanches. Abcès du foie expérimentaux déterminés par les amibes des latex.** [**Inoculations of white mice with plant latex. Experimental abcess of the liver caused by amoebae from the latex.**] Bull. Soc. Path. Exotique **16:** 162–166. *Fig. 1.* 1923.—The parasitized latex of *Euphorbia* spp. and cultures of amoebae derived from plant latex were pathogenic to white mice when ingested or inoculated into the peritoneum.—*Philip Brierley.*

6564. Hyslop, J. A. **Insect pest survey work in the United States.** Jour. Econ. Entomol. **16:** 215–221. 1923.—After reviewing the history of survey work in the U. S. A. from 1889 to the present date, and recounting earlier attempts at this type of work by the U. S. Bureau of Entomology, the scope and objects of survey work are set forth. The main thesis brought forward is that survey work, i.e., the accurate recording of insect abundance from year to year, will indicate, after a reasonable number of years, the zone of optimum ecologic conditions affecting any given insect, and the yearly abundance of an insect will be determined by the departures from these optimum conditions.—*From author's abstract.*

6565. Lutman, B. F. **An outbreak of hopper burn in Vermont.** Phytopathology **13:** 237–241. *Fig. 1.* 1923.—An outbreak of hopper burn, produced by the potato leaf hopper [*Empoasca mali*], on potatoes [*Solanum tuberosum*] is described. The injury to the potato leaves is compared with that produced by physiological tip burn. The author expresses the opinion that the leaf hopper extracts the juices from the vascular and adjoining tissues, causing them to become plasmolyzed to such an extent that they can not recover turgidity and so finally die.—*B. B. Higgins.*

6566. Sasscer, E. R. **Important foreign insects collected on imported nursery stock in 1922.** Jour. Econ. Entomol. **16:** 152–158. 1923.—This paper is primarily a summary of the more important insects intercepted on foreign nursery stock arriving in the U. S. A. in 1922.—*From author's abstract.*

6567. Thorne, Gerald. **Suggestions for control of nematode.** Through the Leaves **1923:** (March): 97–99. The Great Western Sugar Co.: Longmont, Colorado, 1923.—This popular article gives a brief description of the sugar beet nematode (*Heterodera schachtii*) with its habits and methods of control,—the latter based entirely on crop rotation and prevention of infestation. [Cf. also: Facts about Sugar **16:** 192–193. 1923.]—*Frederick V. Rand.*

INFECTIOUS CHLOROSES (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

6568. Bruner, Stephen C. **Mosaic and other cane diseases and pests in Cuba.** Louisiana Planter **70:** 452–455. *Fig. 1–4.* 1923.—The mosaic disease of sugar cane is present in many localities in Cuba but it does not seem to be spreading as rapidly nor doing as much damage as in some other countries like Porto Rico. The Crystalina cane, the variety which is largely grown in Cuba, is more resistant than many varieties. It is believed that the disease is not a menace to the Cuban sugar industry and that it can be controlled satisfactorily with immune and resistant varieties. Other cane diseases are mentioned very briefly.—*C. W. Edgerton.*

6569. Butler, E. J. **Some characteristics of the virus diseases of plants.** British Med. Jour. **1922:** 963–964. 1922.—The diseases of plants caused by an ultramicroscopic agent or virus appear to fall into 4 main groups: (1) mosaics (the largest group); (2) the peach yellows group; (3) forms of variegation which can be transmitted by grafting and in which natural

infection is unknown; and (4) that group resembling in many respects the mosaics, but characterized by phloem necrosis.—The transmission, passage of the virus within the plant and properties of the virus are in turn briefly discussed.—Transmission may be by organic union, by insects, by inoculation with juices from infected plants, or more rarely through the seed. The phenomena of immunity and of "carriers" are exemplified among these diseases. There is much evidence that the virus is conveyed chiefly through the phloem. Plant pathologists were the first to have convicted insects of playing a primary role in natural infection of virus diseases, and they have proved that these diseases may be hereditary in both host plant and insect. They have also shown that the plant cuticle presents an impassable barrier to infection, that a saprophytic life of the causal organisms is highly improbable and that the latter are often so closely associated in some way with the living tissues that infection is only possible in some cases when organic union takes place between diseased and healthy tissues. Plant pathologists, finally, are demonstrating the remarkable effect of the environment, especially temperature, on the course of some of these maladies. Human pathologists, on the other hand, have done more to advance the study of the possible causative agents. [Cf. also: Sci. Progress **17**: 416–431. 1923.]—*Frederick V. Rand.*

6570. Earle, F. S. **Mosaic disease danger. Prompt action needed to stop its spread in Cuba.** Facts about Sugar **16**: 230–231. 1923.—The mosaic disease of sugar cane is spreading rapidly in Cuba and very little is being done to control it. In Porto Rico, the disease is being controlled by seed selection and roguing.—*C. W. Edgerton.*

6571. Matz, Julius. **Naturaleza del mosaico de la caña.** [Nature of cane mosaic.] Sugar **25**: 222–223. 1923.—This is a discussion of the bodies found in the tissues of mosaic-affected plants.—*C. W. Edgerton.*

6572. Maupas, Albert. **Sur la maladie de l'enroulement des feuilles de tomatoes.** [Leaf roll disease of tomatoes.] Rev. Hort. **94**: 52–54. 1922.—The cause of the disease is unknown. There is an accumulation of starch in the parenchymatous cells of the leaf, a lack of chlorophyll, and often a disintegration of the vessels of the leaf. Strains immune to the disease have been secured by planting seed of individual plants showing resistance.—*E. J. Kraus.*

6573. Severin, Henry H. P., William J. Hartung, Edward A. Schwing, and William W. Thomas. **Control of the beet leafhopper.** Facts about Sugar **15**: 134–135, 137. *Fig. 1–6.* 1922.—The leafhoppers and consequently the curly leaf disease of the sugar beet were decreased by dusting the plants with nicotine compounds. It is believed that the disease could be decreased to a considerable extent in isolated fields provided the dust is applied shortly after the spring flight of the hoppers into the cultivated fields.—*C. W. Edgerton.*

6574. Veve, R. A. **The efficiency of the "roguing" method for the eradication of the mottling disease.** Louisiana Planter **69**[2]: 30. 1922.—At Fajardo, Porto Rico, the mosaic of sugar cane has been reduced from 0.5 to 0.002 per cent by roguing. It is believed that good results can be obtained by this practice if the percentage of the disease is less than 15. [Cf. also: Veve, R. A. **Cane Mottling Eradication.** Facts about Sugar **15**: 78. 1922.]—*C. W. Edgerton.*

PARASITIC PHANEROGAMS

6575. Schellenberg, Gustav. **Eine sonderbare neue Wirtspflanze der Lathraea Squamaria L.** [An unusual new host plant of Lathraea Squamaria.] Ber. Deutsch. Bot. Ges. **37**: 427–429. 1919.—In the Botanical Garden of the University of Kiel a growth of *Lathraea* was found apparently parasitizing the beds of *Gunnera manicata* Linden and *G. chilensis* Lam. Investigation showed that Lathraea seed can germinate on *Gunnera chilensis* and are able to develop not only into seedlings but into much older plants with several branches. It was not formerly known that *Lathraea Squamaria* could grow on an herbaceous host plant and *Gunnera*

is especially noteworthy in this respect since it possesses especially fleshy roots. The previously known hosts of *Lathraea* are all woody plants without fleshy roots. The parasite is able to endure the relatively high tannin content of the *Gunnera* roots. Perhaps this large amount of tannin makes growth on *Gunnera* roots possible since *Lathraea* prefers as hosts plants with roots rich in tannin.—*Lillian C. Cash.*

NON-PARASITIC DISEASES

6576. Bartholomew, E. T. **Internal decline of lemons II. Growth rate, water content, and acidity of lemons at different stages of maturity.** Amer. Jour. Bot. **10**: 117-126. 1923.—The size and growth rate of lemon fruits was determined by diameter measurements with a caliper, the acidity by the hydrogen electrode, and the water content by drying in a vacuum oven. The lemon tree tends toward the production of new fruit continuously, but the age of the tree and climatic and soil conditions make production more or less seasonal. Growth rate of fruit is determined by the time of year when set, the age of the tree, and various environmental conditions. Experiment shows that fruits may decrease considerably in size and in water content while still attached to the tree, in consequence of the withdrawal of water from them by the leaves. This may result in the collapse of a portion of the tissue at the stylar end of the fruit, which is the first visible step in the production of internal decline. The wilting coefficient of the soil, as indicated by the leaves, cannot therefore be used to tell whether the fruits are suffering from lack of water. The water content of the 2 ends of a normal lemon is practically the same. As the lemon enlarges, its water content increases, although this increase is very small after the fruit reaches a diameter of about 3.8 cm. The size of the fruit is not necessarily proportional to the amount of water it contains. Mature lemons vary in water content, the range in these experiments being from 88.20 to 92.14 per cent. Total acid content increases rapidly as the fruit approaches maturity, but the true acidity increases very little after a diameter of 3.8 cm. is reached. Both ends of a normal lemon have approximately the same acidity. Mature lemons vary in acidity.—*E. W. Sinnott.*

6577. Neilson, J. A. **The winter injury problem.** Canadian Hort. **44**: 189-192. 1921.—The prevalence of winter injury on various fruits throughout the Province of Ontario is noted. Many forms of winter injury occur, ranging from complete killing of the tree to bud injury, and include root injury, sunscald, black heart, killing of bark on large and small limbs, killing of fruit spurs, fruit buds and terminal growth. Factors which predispose fruit trees to winter injury are noted and discussed together with preventive measures. These include temperature and winds, soil and cultural influences, heavy fruiting and stocks for propagation.—*E. F. Palmer.*

6578. Petit, A. **Un cas de chlorose guéri par le calcaire. [An instance of chlorosis eliminated by lime.]** Rev. Hort. **94**: 154–155. 1922.—Lime is effective against chlorosis caused by acidity of the soil, although an excess of lime causes chlorosis in certain plants particularly sensitive to it, such as some Hydrangeas, Calceolarias, Rhododendrons, and others.—*E. J. Kraus.*

DISEASES OF UNKNOWN CAUSE

6579. Earle, F. S. **Unknown cane disease found.** Facts about Sugar **16**: 383, 385. 1923.—The presence of an unknown cane disease is reported in Porto Rico. The disease first appears as small whitish water-soaked spots on the small leaves while they are still enrolled in the terminal bud spindle. On old leaves the very numerous spots are $\frac{1}{8}$–$\frac{1}{4}$ inch wide and 1–2 inches long. The cause of the trouble was not determined, but the appearance suggested a bacterial origin.—*C. W. Edgerton.*

6580. Lee, H. A., C. G. Welles, and M. G. Medalla. **Fiji disease in the Philippines.** Sugar **24**: 676–677. 1922. [See also Bot. Absts. 12, Entry 1317.]

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

6581. Anonymous. **A preliminary list of the diseases of cultivated plants in Ceylon.** Dept. Agric. Ceylon Bull. 52. *24 p.* 1922.—This is a compilation by members of the staff of the division of botany and mycology. The hosts are arranged alphabetically and under each the causative organisms of the various types of diseases are listed by their technical names under leaf, stem, and root diseases.—*E. D. Merrill.*

6582. Anonymous. **Summary of laws and regulations in force in Ceylon in respect of plant pests and diseases.** Dept. Agric. Ceylon Bull. 48. *6 p.* 1921.—A brief summary is given of the laws and regulations in force covering the importation, disinfecting of plants, destruction of plant pests, etc.—*E. D. Merrill.*

6583. Arnold, G. F. **Uniformity of nursery stock fumigation requirements.** Jour. Econ. Entomol. 16:161–166. 1923.—Recommendations for fumigating nursery stock in the different states vary considerably in the strength of hydrocyanic acid gas to use and the time of exposure necessary. The variations in temperature and humidity throughout the U. S. A. would not permit of standard fumigation regulations for the entire country. It would seem desirable for the states in each section (e.g., the Southern States) to adopt similar fumigation requirements for each kind of plant to be fumigated. Further experiments are suggested to determine the fumigation schedule that could be adopted in each group of states in the country.—*Author's abstract.*

6584. Bald, Claud. **Indian tea: its culture and manufacture, being a text-book on the culture and manufacture of tea.** *4th ed., viii + 397 p., 36 fig.* Thacker, Spink and Co.: Calcutta, 1922.—Thirty-one pages of this work are devoted to a popular discussion of "tea blights" including insect and related pests, fungous diseases, and injuries by lichens and mosses, and by hail.—*Frederick V. Rand.*

6585. Ball, Bert. **Seed potato treatment increases acre yield and profit.** Seed World 11²:15. *1 fig.* 1922.—The author recommends hot formaldehyde solution.—*M. T. Munn.*

6586. Beattie, R. Kent. **Important plant diseases collected on imported nursery stock in 1921 and 1922.** Jour. Econ. Entomol. 16: 146-151. 1923.—Quarantine 37 seeks to reduce the risk of importing foreign plant diseases and insect pests by limiting the entry of plants to those necessary and by surrounding such entry as is permitted with the safeguards of (1) freedom from soil, (2) importation in safest form, (3) inspection on entry, (4) disinfection, (5) field inspection, (6) port inspection of baggage and freight. A list of important plant diseases intercepted during the years 1921 and 1922 is appended.—*Author's abstract.*

6587. Brooks, F. T. **Disease resistance in plants.** British Med. Jour. 1922: 964–966. 1922.—In man the parasites are chiefly bacteria and protozoa, in plants most pathological agents are fungi. In plants individual differences in reaction to disease are less pronounced but races of plants often show marked differences in susceptibility. As to the actual causes of disease resistance in plants little is known. Much so-called immunity is nothing more than disease escape. On the other hand the host does sometimes actively resist penetration by a parasitic fungus, as in certain rusts where the parasite attacks the host so feebly that haustoria cannot be established in the host cells and the fungus soon dies; in other cases the fungus may attack so vigorously that it surrounds itself with a barrier of dead cells which it cannot penetrate. These cases of immunity are purely local in effect and any antibodies found during the struggle are not transferred to other parts of the plant, there to confer immunity to subsequent attacks. With few exceptions parasitic attack in plants is relatively localized, the parasite only gradually enlarging its domain by progressive advancement.—On the other hand, fungi inhabiting the vascular system sometimes secrete toxic substances which, carried in the sap, cause death in distant tissues.—The environment is of particular

significance as regards the incidence of plant diseases.—In plant pathology high resistance rather than absolute immunity is usually concerned. Potato wart is one exception to this rule.—No examples are known where artificial immunity may be conferred on plants by inoculation with a weak strain of an otherwise virulent parasite.—Many plant diseases are due to wound parasites, the latter infecting only by way of dead cells. Although differences in susceptibility to diseases of this type may be just as marked as with obligate parasites like the rusts, the explanation of relative immunity is probably of a considerably different nature in the 2 categories.—*Frederick V. Rand.*

6588. Edgerton, C. W. **Rose diseases in Louisiana.** Louisiana Agric. Exp. Sta. Extension Div. Cir. 63. *8 p., 3 fig.* 1923.—The common rose diseases, mildew, leaf spots, crown gall, blossom blight and canker, are briefly described and directions given for their control.—*C. W. Edgerton.*

6589. Gadd, C. H. **Nut fall of coconuts.** Dept. Agric. Ceylon Bull. 53. *18 p., 3 fig.* 1922.—Very young immature nuts fall as a consequence of an excess of female flowers, sometimes influenced by drought conditions. The fall of older nuts may be caused by the attack of *Phytophthora* sp., or may be caused by mechanical or physiological factors. Bordeaux mixture spray is recommended as a preventive of nut fall caused by fungus attack.—*E. D. Merrill.*

6590. Gadd, C. H. **The efficacy of formaldehyde vapour as a disinfectant of tea seed.** Dept. Agirc. Ceylon Bull. 51. *8 p.* 1921.—The method of disinfection at Colombo is economically unsound, and it does not prove an adequate safeguard against the introduction of fungus pests with tea seed.—*E. D. Merrill.*

6591. Gram, Ernst, og Sofie Rostrup. **Oversigt over Sygdomme hos Landbrugets og Havebrugets Kulturplanter i 1922.** [Review of diseases of cultivated plants, 1922.] Tidsskr. Planteavl 29: 236–307. 1923.—This report covers the period from Oct. 1, 1921 to Sept. 30, 1922. The weather was dry during the fall, exceptionally cold during the winter, the spring was late and the summer cool and moist. The following were reported: *Pleospora graminea* was serious in a few cases on barley; *Tilletia caries* is decreasing because of seed treatment; *Ustilago Hordei, U. Avenae,* and *Urocystis occulta* have increased; *Heterodera Schachtii* var. *Avenae* was most destructive where oats were grown too frequently; larvae of *Oscinis frit* and *Chlorops taeniopus* were disastrous in Jutland; larvae of *Hylemyia coarctata* attacked wheat after several inactive seasons; *Agriotes lineatus* larvae infected summer and winter grain; *Biston zonarius* larvae devoured an alfalfa field; *Hypochnus Solani* was severe; *Sclerotinia sclerotiorum, Ascochyta Pisi,* and *Macrosiphun Pisi* were common on legumes; *Trioza viridula* occurred in Jutland; potato leaf roll, mosaic, and other virus diseases have greatly increased due to hot, dry weather; *Apamea testacea* larvae ruined meadow fescue; *Fusarium Willkommii* (conidial form of *Nectria galligena*) caused storage rot in apples and pears; *Xyloterus dispar* injury on fruit trees was reported for the first time in Denmark; *Hoplocampa testudinea* and *H. fulvicornis* were numerous on apples, pears and plums; *Marsonia Potentillae* var. *Fragariae* was reported for the first time causing strawberry leaf spot; *Anthonomus Rubi* caused severe injury in strawberries; *Acalla comariana* larvae were serious on strawberries; *Phyllotreta nemorum* and other flea beetles made resowing necessary in many cases; *Meligethes aeneus* spoiled seed crops of swedes and other crucifers; *Phyllotreta cucurbitacearum* occurred in leafspots on muskmelons; *Heterosporium Allii* appeared on leeks. Frost injury was bad on some varieties of wheat when late sown and on fruits and ornamentals; salt water injury was caused by heavy storms; spray injury occurred on apples and roses due to 2 per cent Burgundy mixture with 0.05 per cent Schweinfurther green, and on pears due to formalin; a tobacco extract containing free ammonia caused complete defoliation. *Phytophthora infestans* was successfully controlled with 2 per cent Bordeaux mixture on tomato fruits; *Cladosporium fulvum* in greenhouses was controlled by ventilation and night heating, and a 1:40 lime sulphur spray was better than 2 per cent Bordeaux mixture. The migration of *Aphis Fitchii* to grass roots

was demonstrated; the larvae of *Chortophila brassicae* were controlled experimentally with tar paper discs and with 2 waterings with a 0.1 per cent solution of corrosive sublimate; numerous experiments proved that beet mosaic was not carried by seed, and the newly hatched larvae of *Nematus ribesii* were destroyed by tobacco extract spray.—*Albert A. Hansen.*

6592. Hauduroy, Paul. **Atlas de parasitologie.** [Atlas of parasitology.] *53 p., 25 pl.* O. Doin: Paris, 1923.—This "atlas" comprises a set of plates each with a descriptive page, systematically arranged, figuring and briefly describing the parasites of man and animals, beginning with amoebae, flagellates and spirochaetes, including the other parasites of animal affinities, and ending with fungus parasites.—*Frederick V. Rand.*

6593. Lang, William H. **II. Some aspects of vegetable pathology in relation to human disease.** British Med. Jour. 1922: 958–961. 1922.—The common features of all living things justify the attempt at comparisons between pathological processes in plants and animals but it is well to maintain a critical rather than an optimistic attitude.—Comparison is made between pathological reactions in certain fossil Devonian plants and intumescences and wound-calluses of today. It seems obvious to the author that a general correspondence can be traced between the healing of a wound in the plant vs. the animal body, but that more specific comparisons would only lead astray.—Crown gall (*Bacterium tumefaciens* Sm. & Town.), especially as set forth in the researches of Erwin F. Smith, is discussed in some detail, with references also to plant galls of animal causation and to several other diseases of fungus and bacterial origin. There is no doubt that the resemblances between sections of some of the tumor-like growths of crown gall and of animal tumors are striking and may well interest the human pathologist. The author, however, does not accept on the evidence before him all the direct comparisons with malignant tumors in animals nor does he think it wise to draw conclusions as to the etiology of the latter from the undoubted facts as to *B. tumefaciens* being the cause of crown gall. The conception of embryomatous tumors in animals involves the early distinction of germinal layers and of somatic and reproductive cells; there is no strict parallel to this, he says, in plants. The question of actual intrusion, as distinguished from extension of the morbid process to adjoining cells, requires critical reinvestigation.—It is of interest to note that Erwin F. Smith's studies of crown gall have led him to consider and experimentally attack such general underlying problems as the tracing of pathological processes back to changes in the cells and their protoplasm, and as such work is more and more carried out fundamental common features of disease in plants and animals will become increasingly evident. To the philosophical human pathologist the study of some plant diseases will be light-giving, and it is perhaps better not to expect it to be fruit-giving.—*Frederick V. Rand.*

6594. North, D. S. **The control of sugar cane diseases.** Pt. I.—(Continued.) II. **The nature of our diseases and the means for their control.** Australian Sugar Jour. 15: 9–24. 1923.—All the more important Australian cane diseases have been imported with cane and can be propagated by diseased cuttings. The diseases discussed are grouped into 3 types. Type 1. Gumming, leaf scald, leaf stripe, Fiji disease, and mosaic will always produce diseased plants from a diseased set. The diseased plant is highly infectious. There may be alternate hosts, but they have not been traced. Control is by careful selection of healthy seed, eradication of diseased cane, and use of resistant varieties.—Type 2. Red rot, root fungus disease (*Marasmius* type) and the Sclerotial diseases of the leaf sheaths are causd by weak facultative parasites. They live on decaying cane which is attacked only when enfeebled. Healthy cane can be propagated from infected plants. Control is by judicious rotation of crops, cultivation, and use of resistant varieties.—Type 3. Leaf spots such as true rust, eye spot, and ring spot are caused by strict parasites. They are conspicuous but not especially harmful diseases and appear and disappear at particular seasons. Control is by the use of resistant varieties. —Part II. To prevent spreading disease with different varieties of cane safeguards are suggested. Those endorsed in one part of Australia are: (1) every precaution practicable should be taken at the forwarding end that healthy plants are selected for sending; (2) every imported cane should be grown in strict quarantine until its health is assured. Foreign im-

portations should be limited to a few varieties at intervals of years. Only varieties of outstanding promise should be imported. No cane plants should be sent from state to state or mill to mill within Australia except under supervision. Quarantine might be waived only in case of neighboring mills where similar conditions exist, same diseases occur and same standard varieties are grown. Within a mill district bulk transportation of cane should be discouraged except under technical supervision. (3) New varieties should be obtained by raising seedlings rather than importing from abroad. Only seedlings of highest promise should be exchanged with other centers. The exclusion of all foreign canes, at least temporarily, should be considered, but first a general agreement as to quarantine measures should be reached. A quarantine system is now used in 1 region for the introduction of canes from Fiji and New Guinea. A few cane plants are grown in gardens of private residences near Sidney. These gardens are about 1 mile apart. Although so far south of the tropical cane areas, the plants grow satisfactorily when cared for. Monthly inspections for 2 years are made for the presence of diseases or pests.—*C. Rumbold.*

6595. Sorauer, Paul. **Handbuch der Pflanzenkrankheiten begründet von Paul Sorauer.** *4th ed.* Edited by G. Lindau in cooperation with E. Köhler, R. Laubert, W. Wollenweber, and H. Zillig. Vol. 3. **Die pflanzlichen Parasiten.** Pt. 2. [**Handbook of plant diseases founded by Paul Sorauer. Diseases caused by vegetable parasites.**] *vi + 310 p., 55 fig.* Paul Parey: Berlin, 1923.—This volume continues the discussion of parasitic fungi begun in volume 2, part 1, and under this heading includes the Basidiomycetes and Fungi Imperfecti, with a special chapter on the genus *Fusarium* by H. W. Wollenweber. This is followed by sections on parasitic algae, lichens, phanerogamic parasites; and a final section on prevention and control of fungous diseases of plants, a special chapter on the smuts, by H. Zillig, and a supplement to the Hypodermataceae.—Treatment of the subject includes general descriptions and discussions of the major groups with keys to the principal genera, and descriptions and discussions of genera and species. [See also Bot. Absts. 12, Entries 2050, 2051.]—*Frederick V. Rand.*

6596. Stearns, L. A., and W. S. Hough. **Spreader tests on apples and peaches.** Jour. Econ. Entomol. **16:** 198–207. 1923.—Casein and flour-paste have received considerable attention for some time as spreaders and adhesives in spray solutions. In 1922, orchard tests were conducted with Kayso, a prepared casein spreader, and Magnet Dry Paste, a prepared flour-paste spreader to determine their effectiveness as influencing the spreading and adherence of the summer applications in the scheduled programs for apple and peach spraying in Virginia.—Neither of the spreaders used increased the effectiveness of the spray solution in protecting the fruit from insects and diseases. The same was true in case of the foliage. It is doubtful whether the addition of a spreader, such as the 2 used, would pay for the increased cost of the spray. Nicotine sulphate 40 per cent (Black Leaf 40) and casein (Kayso) as used, were uncongenial.—*Authors' abstract.*

6597. Taubenhaus, J. J. **The culture and diseases of the sweet potato.** *xv + 286 p., 29 fig.* E. P. Dutton and Co: New York, 1923.—Of this comprehensive work on the sweet potato 75 pages are devoted to its diseases. The discussion under this head includes the morphology of the healthy host, losses from sweet potato diseases, specific diseases, insects, and other pests. Under "Specific diseases" some 25 or more sweet potato maladies are discussed as to kind and amount of injury, causal organism if any, control, and other special points of interest relative to particular diseases.—*Frederick V. Rand.*

6598. [Taylor, E. H.] **Cane diseases in the Philippines.** Sugar **24:** 504–505. 1922.—This is a brief account of the Fiji disease and the Formosa leaf-stripe disease of sugar cane, 2 diseases introduced into the Philippines within the preceding 10 years.—*C. W. Edgerton.*

6599. Whetzel, H. H. **Dusting in Bermuda.** Agric. Bull. Bermuda Dept. Agric. **2**[5]: 9–10. 1923.—Observations and suggestions are presented on the status of dusting in the Islands with directions and suggestions for its more effective application.—*H. H. Whetzel.*

6600. Whetzel, H. H. **The plant disease situation.** [Special report on plant diseases in Bermuda.] Agric. Bull. Bermuda Dept. Agric. 2^5: 2–9. 1923.—A report on diseases and pests was presented to the Director and Board of Agriculture following a 10-days' visit to the Islands during April, 1923. The epiphytotic of onion blight caused by *Peronospora schleideniana* is briefly presented. A loss of about 75 per cent of the crop is predicted. Late blight of the potato is reported as severe in the Garnet crop due to the cool rainy season. Snapdragon rust, caused by *Puccinia Antirrhini*, first observed in Bermuda in 1922 has swept the Islands, practically ruining this ornamental plant and promising to make the growing of snapdragons there impossible in the future. The oleander scale (*Aulicaspis pentagona*), so destructive during the past 2 or 3 years, is rapidly being brought under control by imported parasites. Celery blight (*Septoria petroselina*) and onion pink rot (*Fusarium Mali*) were less severe than in 1922. Remarkable progress in development of dusting in the Islands is reported.—*H. H. Whetzel.*

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

H. W. Youngken, *Editor*

E. N. Gathercoal, *Assistant Editor*

(See also in this issue Entries 6213, 6300, 6491, 6624, 6647, 6733)

6601. Anonymous. **The cultivation of medicinal plants in France.** Amer. Druggist and Pharm. Rec. **71**: 11–14. *6 fig.* 1923.—The author describes the organization of the Committee of Medicinal Plants, which was necessary because of the failure of supplies from Germany and Austria; the conditions under which collection and marketing wild plants is profitable, and the cultivation of plants which cannot be supplied by other means.—*C. M. Sterling.*

6602. Blokzeyl, K. R. F. **Essential oil production in Java.** Pharm. Era **56**: 667–670, 694. *5 fig.* 1923.—An account is given of the sources, collection of plants, and distillation of oils of Citronella, Lemongrass, Cananga, Vetivert, Patchouli, and Cajuput.—*C. M. Sterling.*

6603. Gorter, K. **Sur la laurotétanine, l'alcadoïde tétanisant de diverses Lauracées.** [On the constituents of laurel—the alkaloidal content of various Lauraceae.] Bull. Jard. Bot. Buitenzorg III, **3**: 180–198. 1921.

6604. Jonesson, A. **The most widely used crude drug.** Pharm. Era **56**: 607–608. *4 fig.* 1923.—The author gives a history of the varieties of senna, their collection, marketing, and uses.—*C. M. Sterling.*

6605. Koch, F. J. **The whence of the lavender.** Amer. Druggist and Pharm. Rec. **71**: 20–21. *2 fig.* 1923.—A brief account is presented of the habitat, collection, and preparation of lavender.—*C. M. Sterling.*

6606. Kritiker, D. B. **Some important drugs of India, their chemical constituents, therapeutics and native uses.** Amer. Druggist and Pharm. Rec. **71**: 20–22. 1923.—A description is given of the most important drugs derived from India, giving the habitat and methods of preparation as well as the chemical constituents and therapeutic uses of Indian Hemp, Sandalwood, Myristica, Mace, Podophyllum, Nux Vomica, Pomegranate, Turmeric, Catechu, and Opium.—*C. M. Sterling.*

6607. Moll, J. W., and H. H. Janssonius. **Botanical pen-portraits.** *viii + 472 p., 111 fig.* Martinus Nijhoff: The Hague, 1923.—The authors have attempted for micrography what has been so well done in phytography. The work attempts to give so accurate and so complete a description of the microscopic structure of the plant or part of the plant (the authors have selected for their study the description of 100 vegetable drugs), that a drawing is not

needed. A pen-portrait gives more than any drawing, for the latter can represent only a single individual and therefore but one aspect of the object. The pen-portrait not only combined the descriptions of sections in various directions into a perspective description, and thus portrays the tissues as bodies with 3 dimensions, but can also combine the descriptions of several individuals, so that a knowledge of "habit" of that particular object is acquired. In order to do this, 21 "guiding schemes" for the descriptions have been constructed, each calling critical attention to what ought to be observed. For example, in the Guiding Scheme for the Description of the Leaf, more than 150 points are stressed; even in the Guiding Scheme for the Description of a Stamen attention is called to more than 150 points. In nearly all cases the authors, after giving the Latin and English official names, and the part official, describe the (1) "macroscopic characters," a scheme for which is also included among the list of schemes; (2) "anatomical characters," under which caption appears a fairly exhaustive literature on the drug, a remark on the nature of the material used,—whether fresh or dry, if fresh, how fixed, etc., and the list of reagents used; (3) "micrography," the main portion of the work; (4) "micrography of the powder," given in only part of the cases. A carefully arranged list of literature on the subject, a complete list of the chemicals and reagents used, and a glossary of the anatomical terms used, add to the value of the work. Following is a list of the drugs described, 60 of which are in the U. S. Pharmacopoeia: Amylum Manihot, Amylum Marantae, Amylum Maidis, Amylum Oryzae, Amylum Tritici, Bulbus Scillae, Carrageen, Caryophylli, Cortex Alyxiae, Cortex Cinnamoni, Cortex Condurango, Cortex Cuspariae, Cortex Fructus Aurantii, Cortex Granati, Cortex Hamamelidis, Cortex Mezerei, Cortex Pruni virginianae, Cortex Quillaiae, Cortex Rhamni Frangulae, Cortex Rhamni Purshianae, Cortex Syzygii, Cortex Viburni prunifolii, Flores Arnicae, Flores Chamomillae vulgaris, Flores Cinae, Flores Tiliae, Folia Althaeae, Folia Buchu, Folia Cocae, Folia Digitalis, Folia Eucalypti, Folia Jaborandi, Folia Laurocerasi, Folia Menthae piperitae, Folia Salviae, Folia Sennae, Folia Stramonii, Folia Taraxaci, Folia Trifolii fibrini, Folia Uvae Ursi, Fructus Anethi, Fructus Anisi, Fructus Carui, Fructus Colocynthidis, Fructus Conii, Fructus Coriandri, Fructus Cubebae, Fructus Foeniculi, Fructus Pimentae, Fructus Piperis nigri, Fructus Sambuci recentes, Gallae, Glandulae Lupuli, Herba Absinthii, Herba Aconiti recens, Herba Belladonnae recens, Herba Cannabis indicae, Herba Cardui benedicti, Herba Centaurii, Herba Conii, Herba Hyoscyami, Herba Sabinae, Lichen islandicus, Lignum Guaiaci, Lignum Quassiae, Lignum Santalinum, Lycopodium, Petala Rhoeados Petala Rosae gallicae, Radix Aconiti, Radix Althaeae, Radix Armoraciae, Radix Belladonnae, Radix Helenii, Radix Jalapae, Radix Liquiritiae, Radix Pyrethri, Radix Sarsa parillae, Radix Taraxaci, Radix Valerianae, Rhizoma Arnicae, Rhizoma Calami, Rhizoma Filicis, Rhizoma Hydrastis, Rhizoma Podophylli, Rhizoma Zingiberis, Secale cornutum, Semen Amygdalae dulcis, Semen Amygdalae amarae, Semen Cardamomi, Semen Colchici, Semen Lini, Semen Myristicae, Semen Physostigmatis, Semen Sinapis albae, Semen Sinapis, Semen Stramonii, Semen Strychni, Stigmata Croci.—*C. C. Plitt.*

PHYSIOLOGY

B. M. Duggar, *Editor*

William J. Robbins, *Assistant Editor*

(See also in this issue Entries 6146, 6147, 6154, 6155, 6156, 6159, 6176, 6186, 6190, 6196, 6200, 6212, 6227, 6230, 6243, 6244, 6245, 6247, 6248, 6281, 6316, 6358, 6379, 6387, 6388, 6447, 6454, 6458, 6476, 6508, 6509, 6524, 6565, 6576, 6578, 6694, 6727, 6734)

GENERAL

6608. Falk, I. S. **The role of certain ions in bacterial physiology.** Absts. Bact. 7: 33–50, 87–105, 133–147. 1923.—This is a review of the literature to Sept., 1922, and partially revised to Feb. 1, 1923. The following chapters are included: cations in general physiology; inorganic content of the bacteria; cations in synthetic media; cations in growth, viability, and disin-

fection; cations in soils, ammonification, nitrification, nitrogen fixation; cations in permeability; cations in immunity reactions; theory of ion action; bibliography (p. 133–147.)—*D. Reddick.*

DIFFUSION, PHYSICO-CHEMICAL PHENOMENA

6609. Addoms, Ruth M. **The effect of the hydrogen ion on the protoplasm of the root hairs of wheat.** Amer. Jour. Bot. 10: 211–220. *1 pl.* 1923.—Wheat seedlings were grown in 5 nutrient solutions selected from Shive's "optimal" group, in all of which the osmotic concentration (1.75 atmospheres) and the lime-magnesium ratio were essentially constant. The H-ion concentration varied from pH 3.94 to pH 3.47 owing to differences in the amount of KH_2PO_4 used. In those solutions in which the H-ion concentration was high, the root systems were abnormal in being short, stubby, and much branched. In the root-hairs of such roots, when studied under the dark-field microscope, the protoplasm was found to be coagulated and flocculated as compared with its normal condition in other roots. The relation of this effect to the colloid chemistry of protoplasm is discussed. The author suggests that the injurious influence of high H-ion concentration is due to the fact that it renders the root-hairs ineffective as absorbing organs, and she believes that a direct relation between the H-ion concentration of a nutrient solution and any single plant character, such as yield, consequently cannot exist.—*E. W. Sinnott.*

6610. Hofler, Karl. **Über den zeitlichen Verlauf der Plasmadurchlässigkeit in Salzlösungen I.** [The speed of plasma penetrability in salt solutions.] Ber. Deutsch. Bot. Ges. 37: 314–326. 1919.—The author investigated the length of time for the protoplast to take up salt solutions, using cells of *Tradescantia elongata* and a technique described in an earlier paper [Ber. Deutsch. Bot. Ges. 36: 414. 1918.] Cane sugar and KNO_3 were the substances used, both in hypertonic solutions. When the protoplast, after a 2-hour plasmolysis, reaches its final form and the direct measurement can be made, the permeability is still normal. Similar cells behave very differently. Even the same cell can, in consecutive experiments, take up varying amounts of KNO_3. The clearest line of behavior is the very gradual increase of permeability in the hours before death. Furthermore there are demonstrated unknown reversible variations in permeability in the living protoplast, which are very different in single cases and which can not be caused by direct reaction from outside stimuli.—*S. F. Cook.*

6611. Hofler, K., und A. Stiegler. **Ein auffälliger Permeabilitätsversuch in Harnstofflösung.** [A striking experiment in permeability with a urea solution.] Ber. Deutsch. Bot. Ges. 39: 157–164. 1921.—Experiments were performed, using the epidermal cells of the stem of *Gentiana Sturmiana* and following the plasmometric method. It was found that urea penetrated in great quantities and quite rapidly, as shown by the fact that the protoplasm shrank for a few minutes and then very quickly returned to its normal position. The amount of penetration was 30–60 times as much as has been observed in the case of other plants (*Rhoeo, Tradescantia, Allium*). It was found that the permeability of the cells to urea was 170 times greater than the permeability to KNO_3. Furthermore, only the stem epidermal cells could be made to show this unusual permeability to urea, and the authors state that this is the 1st surely proved case of a differential permeability of the plasma of different tissues of the same plant.—*S. F. Cook.*

6612. Quirk, Agnes, J., and Edna H. Fawcett. With introduction by Erwin F. Smith. **Hydrogen-ion concentration vs. titratable acidity in culture mediums.** Jour. Infect. Diseases 33: 1–59. *Pl. 1 (col.), fig. 1–10.* 1923.—Extensive experiments are reported with regard to measuring and adjusting the reaction of beef infusion media. The titrimetric and H-ion methods of determining acidity and alkalinity are compared. The color "faint but distinct, pink" by phenolphthalein was found to be pH 8.2 and was called the zero of the Fuller's scale. The 1st change in color occurred at pH 7.8. At the rose pink color the pH was 8.4. Formulae are given for converting pH readings to Fuller's scale and for obtaining the pH having given the Fuller's scale titration readings. Experiments were conducted to determine the effects

of dilution in preparing beef broth, the variations in media prepared from different samples of the same portion of beef, and the variations between broths from different cuts of beef with and without dilution. It was found that average pH values varied in the same direction as the average titration values. Fuller's scale values were readily transferable to pH values. Media having graded additions of acid and alkali showed buffer effects causing the reaction to vary from the theoretical. The reaction by the Fuller's scale and pH followed one another closely, but did not coincide. The reaction became more acid in the media upon standing. The hot infusion had a slightly greater buffer effect than the cold. These 2 varied appreciably only at the extreme ranges. The Fuller's scale and pH reactions of beef extract broths having graded additions of alkali did not coincide as they did in beef infusions. Gelatin increased the buffer content of beef infusion while agar exerted no appreciable effect.—The authors conclude that the titration method of determining the reaction of media based on peptone beef infusion is not illogical and unusable as Clark and others have claimed. In general, titrametric methods were believed to be fully as desirable as the colorimetric determination of the H-ions for obtaining the reaction of beef infusion media within the limits of + 30 and −10 Fuller's scale, corresponding to pH 5.2 and 9.2 respectively. Of a considerable number of plant pathogens studied most of them exhibited growth limits within these ranges.—*R. L. Starkey.*

6613. Schaede, Reinhold. **Über das Verhalten von Pflanzenzellen gegenüber Anilinfarbstoffen. [The behavior of plant cells toward anilin dyes.]** Jahrb. Wiss. Bot. 62: 65–91. 1923.—The author made a study of dye penetration into the root hairs of *Hydrocharis morsus ranae*. Great care was exercised to use fresh material and protoplasmic streaming was taken as a criterion of the normal condition of the cell. The following dyes were used: chrysoidin, Bismark brown, methyl violet, gentian violet, methylene blue (in distilled and tap water), neutral red, safranin, acid fuchsin (in distilled and tap water). Chrysoidin was the only dye which penetrated uninjured plasma. There was coloration with Bismark brown and gentian violet after injury to the cell. No case of nuclear staining, intra vitam, was observed. Methyl violet and gentian violet penetrated the microsomes but this is connected with the toxic effect of the dyes. A precipitate of doubtful nature was caused in the cell sap by methyl violet, gentian violet, and safranin. The author points out the correlation between the acidity or basicity of the dye and the cell as determined by the penetration of the dyes. The cytoplasm is basic when alive and acid when dead. The microsomes are probably acid and the cell sap neutral.—*S. F. Cook.*

6614. Stern, Kurt. **Über negative Osmosen und verwandte Erscheinungen. [Negative osmosis and related phenomena.]** Ber. Deutsch. Bot. Ges. 37: 334–343. 1919.—The scheme of the processes taking place on semipermeable precipitation membranes and the theory of osmotic pressure have until recently served to explain the passage of liquids through plant cell membranes. The author considers the question of the limitation of this method and its correct application. After a critical review of the work on electro-endosmosis from Dutrochet and Graham to the present time he concludes that if at present no definite proof of the presence of negative osmosis in plant protoplasm has been discovered, nevertheless, in view of the physical and physiological evidence, it must be regarded as very probable. *S. F. Cook.*

6615. Weber, Friedl. **Die Zellsaftviscosität lebender Pflanzenzellen. [The cell sap viscosity of living plant cells.]** Ber. Deutsch. Bot. Ges. 39: 188–193. 1921.—The author uses the time in which calcium oxalate crystals fall through the sap of cells of *Callisia repens* as a criterion of the viscosity of the sap, applying the formula of Stoke's law: $V = \frac{2}{9} \frac{D-d}{n} gr^2$. He finds that the viscosity is about 2 times that of water, and that it decreases with a rise of temperature with a coefficient of from 1.13 to 1.19.—*S. F. Cook.*

WATER RELATIONS

6616. Bode, Hans Robert. **Beiträge zur Dynamik der Wasserbewegung in den Gefässpflanzen. [Contribution to the dynamics of the movement of water in the vascular plants.]** Jahrb. Wiss. Bot. 62: 92–127. 1923.—The author made a large number of observations and experiments, using several methods of technique, on the following plants: *Impatiens Sultani, Tradescantia zebrina, Elatostemma sessile, Cucurbita Pepo, Syringa vulgaris, Lycium halimifolium, Taxus baccata, Gingko biloba, Phaseolus, Sambucus*, and *Helianthus annuus*. Direct microscopic examination of the vessels of wilted plants, under the most unfavorable conditions of water conduction, showed that the continuity of the water columns in the vessels was unbroken. The presence of a cohesion tension is shown by wounding the vessels under mercury, which is taken into the vessel in direct contact with the water, and it is made clear that it is impossible for the gas, dissolved in the water, to separate as bubbles. Such bubbles, found by the older workers, were due to faulty technique. The diameter of the vessels of herbaceous plants was observed to shrink, under unfavorable conditions, this being due to the cohesion tension of the water columns. In both the stem and root the filtration resistance shows a complete proportionality with the difference in pressure.—*S. F. Cook.*

MINERAL NUTRIENTS AND SALT RELATIONS

6617. Hoffer, G. N., and R. H. Carr. **Accumulation of aluminum and iron compounds in corn plants in its probable relation to rootrots.** Jour. Agric. Res. 23: 801–823. *Pl. 1 (col.)-21.* 1923.—A disintegration of tissue in the nodal plate of maize occurs in the absence of specific organisms. These regions show an excessive amount of iron or aluminum compounds or both. Brown, yellowish brown, and brownish purple lesions similar to those in diseased plants have been produced by injecting solutions of certain salts of aluminum and iron into the plants. A definite cumulative toxicity of aluminum salts was established by the injection experiments and the same phenomenon is believed to occur naturally in the field. The most severe cases of rootrot are found in soils deficient in lime and available phosphates but with variable quantities of salts of aluminum and iron available for absorption. Such organisms as *Fusarium moniliforme, Gibberella Saubinetii*, etc., are thought to be ubiquitous and under favorable conditions attack plants which are already weakened by the accumulation of toxic salts. Those plants which show the largest accumulation of iron and aluminum are the ones which develop the most severe cases of rootrot.—"The application of lime and phosphates to soils in which rootrots have developed in destructive proportions has been decidedly beneficial in controlling them. The use of limestone alone in some instances proved harmful, but in all cases studied the application of available phosphates produced plants which were better and more resistant to the rootrots."—*D. Reddick.*

6618. Tottingham, W. E., and E. J. Rankin. **The availability of iron in nutrient solutions for wheat.** Amer. Jour. Bot. 10: 203–210. *4 fig.* 1923.—The solubility of ferric citrate, phosphate, and sulphate, and of ferrous sulphate, were determined at pH 4.2 and pH 6.0 of the Livingston-Tottingham nutrient solution. Ferric phosphate is relatively insoluble, and ferric and ferrous sulphate are so in solutions which approach neutrality. Ferric citrate is not very soluble but its solubility is maintained over a considerable range of pH values. The H-ion concentration is increased by ferric sulphate, decreased by ferric citrate, and affected little by the others. Young wheat plants showed much better growth in ferric citrate than in any other form of iron, the unfavorable effect of the others being presumably due to low solubility or to modification of the H-ion concentration.—*E. W. Sinnott.*

PHOTOSYNTHESIS, CHLOROPHYLL

6619. Wlodek, Jean. **Recherches sur l'influence des engrais chimiques sur le coefficient chlorophyllien. [The influence of chemical fertilizers on the chlorophyll coefficient.]** Bull. Acad. Polonaise Sci. et Lettres Classe Sci. Math. et Nat., Ser. B. 1920: 19–52. 1922.—Determinations were made of the chlorophyll coefficient, neochlorophyll (*A*): allochlorophyll

(*B*) (Willstaetter's Chlorophyll a and b) by comparing the limits of the absorption bands by means of a Wagner spectrometer (Zeitschr. Instrumentenk. 1913, p. 149). The living leaves of potato and sugar-beet were studied, grown in soils to which various fertilizers were added: (1) without fertilizer; (2) P, K, and N: (3) P and N, but no K: (4) P, N, Mg, no K: (5) K, N, no P: (6) P, K, no N. It is concluded that after a certain period of development of the plants the relation of the chlorophyll pigments varies during the course of 24 hours; *B* increases during the day and *A* during the night. The lack of K results in an absolute and relative diminution of *B* and an increase in *A*, as well as a reduction of the daily variation of the 2 components. Lack of P also reduces the daily variation of the chlorophyll components and narrows the absorption bands; N tends to reduce *A* and augment *B*. The action of Ca and Mg is not definitely established.—*H. A. Spoehr.*

6620. Wlodek, Jean. **Recherches sur l'influence de la lumière et des engrais chimiques sur le coefficient chlorophyllien. [The influence of light and of chemical fertilizers on the chlorophyll coefficient.]** Bull. Acad. Polonaise Sci. et Lettres Classe Sci. Math. et Nat., Ser. B. **1921**: 143–190. 1922.—I. Using the same methods as in the foregoing paper [see preceding entry] Wlodek has studied the variations of the chlorophyll coefficient in *Iris germanica* under the influence of light, with attached and excised leaves. During illumination the absorption bands shift toward the more refrangible portion of the spectrum and in the opposite direction in the dark. In illuminated leaves the absorption band of allochlorophyll becomes wider, that of neochlorophyll narrower, while the reverse happens in the dark. This change does not take place instantaneously, requiring ¾–2 hours. The shifting of the absorption band is noticeable after 15 minutes. Leaves which have died through wilting show an increased chlorophyll coefficient and a shifting of the absorption band towards the violet. Ether diminishes the variations in the chlorophyll coefficient.—II. In endeavoring to relate the chlorophyll coefficient to mineral nutrients of oats, barley, and beans, it was found that with a lack of K the coefficient diminishes at a certain phase of development of the plants. This is due to an increase of the absorption band of neochlorophyll and a decrease in that of allochlorophyll, as compared with plants grown under normal conditions. A lack of N in the soil increases the chlorophyll coefficient. A relation seems to exist between the width of the first absorption band and the nitrogen content in fresh bean leaves, in the straw and harvest of oats and barley. The nitrogen content increases with the width of the band. With a lack of K the chlorophyll coefficient does not change under the influence of light and darkness. In leaves which show an abnormal chlorophyll coefficient the production of vegetative material is less.—*H. A. Spoehr.*

METABOLISM (GENERAL)

6621. Bergmann, Max. **The structure of sucrose.** Jour. Chem. Soc. [London] **123**: 1277–1279. 1923.

6622. Brown, Elmer B., and Treat B. Johnson. **The sugar found in tuberculinic acid, the nucleic acid of the tubercle bacillus.** Jour. Amer. Chem. Soc. **45**: 1823–1827. 1923.—In a former paper the authors found that this nucleic acid contained the pyrimidines, thymine and cytosine, but no uracil. In this paper they report the observation that the sugar making up the carbohydrate of this nucleic acid is a hexose rather than a pentose. From their findings it seems that the nucleic acid of the bacillus of tuberculosis resembles the nucleic acid of the animal rather than that of the plant. A complete description of the chemical methods used in this work is given.—*J. M. Brannon.*

6623. Brunswik, Hermann. **Über Hesperidinsphärite im lebenden Hautgewebe von Anthurium Binotii Linden. [Hesperidin sphaerocrystals in living cells of Anthurium Binotis.]** Ber. Deutsch. Bot. Ges. **39**: 209–213. 1921.—Hesperidin, a rhamnoside glucoside, has been found in a monocotyledon, *Anthurium Binoti* Linden, and in crystalline form. Both are rare occurrences, since it had previously been reported in 24 dicotyledonous famillies, but in only 2 monocotyledonous families and always in solution in the cell sap.—The chemical reactions

and solubilities of the crystals are described. They are the usual tests for hesperidin.—Twelve other species of *Anthurium* were examined for hesperidin but none was found.—*S. H. Eckerson.*

6624. Dobbin, Leonard. **On the presence of formic acid in the stinging hairs of the nettle.** Proc. Roy. Soc. Edinburgh 39: 137–142. 1919.—The experimental evidence upon which the textbook statements regarding the presence of formic acid in the stinging hairs of the common nettles, *Urtica dioica* or *U. urens*, are based is regarded as inadequate in the light of present-day knowledge. The author collected the exudate from the hairs by applying to the leaves strips of the very best filter paper impregnated with barium carbonate. This fixed the free acid of hairs without contamination from the protoplasmic contents of the cells. The paper was then tested for the presence of barium formate. This was done by extraction with cold water, filtering, mixing with phosphoric acid, and distilling. The distillate was mixed with lead or barium hydroxides, filtered, saturated with carbon dioxide, and evaporated to dryness on a steam bath. The residue was extracted with hot water and filtered. The filtrate was placed in small drops on glass slides and evaporated over sulphuric acid. These were examined with the polarizing microscope and found to show (a) "stellate groupings of strongly bi-refringent needles and (b) single crystals with well developed faces and sharp edges," both of which behave optically as lead formate. Slides from solutions in which barium hydroxide replaced the lead were confirmatory. They showed extremely bi-sphenoid crystals. The conclusion is thus reached that free formic acid is present in the stinging hairs of the common nettle. [See also Bot. Absts. 8, Entry 1461.]—*Ray C. Friesner.*

6625. Farnell, R. G. **Preliminary investigations on the pectic substances of plants.** Internat. Sugar Jour. 25: 248–251. 1923.—The extraction and properties of plant tissue pectinogen (that is, pectin producing) are described. The yield of dry pectinogen from turnip, onion, and pods of peas was 20, 16, and 8 per cent; the galactan found was 40.9, 34.9 and 17.9 per cent; pentose 37.6, 17.6 and 30.7 per cent; and methoxyl 10.2, 3.2 and 1.9 per cent.—*C. Rumbold.*

6626. Hooker, H. D., Jr. **Seasonal changes in the chemical composition of apple spurs.** Missouri Agric. Exp. Sta. Res. Bull. 40. *51 p., 28 fig.* 1920.—Samples of apple spurs with leaves, flowers, or fruit removed were collected 6 times during the year. Three types were investigated: spurs that blossomed and bore fruit; spurs that did not blossom, but which developed fruit-buds; and barren spurs that neither blossomed nor developed fruit-buds. The 1st type was represented by Wealthy, Ben Davis, and Jonathan; the 2nd by Jonathan and Ben Davis,—the Jonathan being the same one from which samples of the 1st type were taken; the 3rd by Ben Davis and Nixonite. Determinations were made of the dry weight, ash, titratable acidity, potassium, phosphorus, total nitrogen, reducing and non-reducing sugars, starch, total polysaccharids and H-ion concentration. In general, official analytical methods of the Association of Official Agricultural Chemists were used. The starch values were obtained by digestion, followed by hydrolysis of the digestion products. Some supplementary microchemical tests were made. The seasonal changes in most of the constituents examined were distinct and characteristic of the condition of the spur,—bearing, non-bearing, or barren. In general the bearing and barren spurs showed extreme values, while the non-bearing spurs assumed intermediate positions. The conditions characteristic of bearing and non-bearing spurs of the same tree (Jonathan) were practically identical with the conditions of spurs from different trees (Ben Davis) in the bearing and in the off-year respectively. Spurs from barren trees were characterized by a seasonal chemical picture distinctly different from the 2 types of spurs from productive trees. For most constituents, the spurs passed through 1 period of maximum content and 1 of minimum content during the course of the year. In the cases of starch and titratable acidity there were 2 maxima and 2 minima, the maxima of 1 coming at approximately the same time as the minima of the other. Carbohydrate consumption and titratable acidity are thought to be correlated. Conditions leading to high starch content at the time of fruit-bud differentiation is considered to be essential for fruitfulness.

Barren spurs and fruit-bearing spurs that developed leaf buds had a low starch content in June. During the late summer and fall there was a steady increase in the phosphorus and nitrogen content of spurs with fruit buds. The absence of this feature in barren spurs suggested that phosphorus and nitrogen storage was connected with the marked increase in these elements that was peculiar to bearing spurs in the spring.—*H. D. Hooker, Jr.*

6627. Irvine, James Colquhoun. **Some constitutional problems of carbohydrate chemistry.** Jour. Chem. Soc. [London] 123: 898–921. 1923.—This is a discussion of present knowledge regarding the molecular structure of glucose, maltose, cellobiose, lactose, sucrose, cellulose, starch, glycogen, inulin, certain glucosides (salicin, helicin, and populin), and the λ-sugars (forms in which the oxygen ring is displaced from the normal stable position). Numerous diagrams are given showing the arrangment and attachment of atoms and groups of atoms.—*F. E. Denny.*

6628. Murschhauser, Hans. **Das optische Drehungsvermögen der Dextrose unter dem Einfluss von Salzsäure. II. Änderung des Drehungs- und Reduktionsvermögens von Dextroselösungen in Salzsäure bei 100°. [The influence of hydrochloric acid on the optical rotation of dextrose. II. Change in rotation and reducing power of dextrose solution by hydrochloric acid at 100°.]** Biochem. Zeitschr. 116: 171–190. 1921.—In an earlier paper it was shown that at room temperature the addition of HCl to dextrose solution hastened the return to the constant rotation of $(L)_d$ 52.5°. The addition of HCl to a greater concentration than 2 per cent increased the constant rotation somewhat. This change was also dependent upon the dextrose concentration. In the present paper 20, 10, 5, and 2.25 per cent dextrose solutions were heated at 100°C. for varying lengths of time with 5.1, 8.1, and 10.2 per cent HCl. The 20 and 10 per cent dextrose solutions each exhibited an increase in dextro-rotation on treatment, this increase being greater with the 20 than with the 10 per cent sugar solution. The greater the concentration of HCl the sooner is the peak reached in the 20 per cent solution. In the 10 per cent solution all HCl concentrations are equally effective in increasing the rotation. The decrease in rotation on continued heating is greater the higher the HCl concentration is, but the total decrease is not as great in the 20 per cent as in the 10 per cent dextrose solution. From the beginning of the heating there is a decrease in the reducing power of the solutions. The decrease in reducing power increases with increase in acid content, but the decrease is slightly greater (concentration for concentration) in the 20 per cent than in the 10 per cent dextrose solution. At no time is there an increase in dextro-rotation with the 5 and 2.25 per cent dextrose solutions. The decrease in dextro-rotation is almost parallel with that in 10 per cent solution. The writer explains the increase in dextro-rotation as being due to the formation of isomaltose or some polysaccharid such as dextrin, which has a higher dextro-rotation than the dextrose. There is more of this substance formed in a high concentration of dextrose than in a low concentration. The loss in reducing power would be partly due to the formation of the polysaccharid and partly to a breaking down of the dextrose.—*F. G. Gustafson.*

6629. Nagayama, T. **Über die Zerlegung der Brenztraubensäure durch verschiedene Pilze. [The decomposition of pyroracemic acid by fungi.]** Biochem. Zeitschr. 116: 303–306. 1921.—*Monilia candida, Oidium lactis, Aspergillus niger mutante, Mucor plumbeus, M. Rouxii,* and *M. racemosus* are able to decompose pyroracemic acid into acetaldehyde when present in the nutrient solution. The addition of sulphate increases the yield of acetaldehyde. Nutrient solutions without pyroracemic acid yield no acetaldehyde.—*F. G. Gustafson.*

6630. Patterson, Jocelyn. **Investigation of the mannan present in vegetable ivory.** Jour. Chem. Soc. [London] 123: 1139–1149. 1923.—The endosperm of the seed of the tagua palm was used as material for the investigation of the chemical constitution of the mannan.—*F. E. Denny.*

METABOLISM (NITROGEN RELATIONS)

6631. Franzen, Hartwig, Adolph Wagner, und Artur Schneider. **Über die chemischen Bestandteile grüner Pflanzen. XIII. Über die flüchtigen basischen Stoffe grüner Pflanzen.** [Chemical constitutions of green plants. XIII. Volatile bases in green plants.] Biochem. Zeitschr. **116**: 208–214. 1921.—It was found by titrating distillates obtained from 28 species with $\frac{N}{10}$ HCl, using methyl red as indicator, that there are volatile bases in green plants. *Rheum Rhaponticum*, required 146 cc. of $\frac{N}{10}$ HCl per kgm. of fresh plant to neutralize the base; *Vitis vinifera*, 88 cc. The other 26 species contained much less volatile base; *Quercus sessiliflora* and *Viburnum lantana* required only 5.5 cc. per kgm. of green material. In 13 of the 28 species examined ammonia was the chief volatile base. Other bases were present in much smaller quantities. The conclusion is drawn that ammonia or substances easily breaking down to ammonia are widely distributed in green plants.—*F. G. Gustafson.*

METABOLISM (ENZYMES, FERMENTATION)

6632. Kopeloff, Nicholas, C. J. Welcome, and Lillian Kopeloff. **Prevention of sugar deterioration.** Sugar **24**: 388–389, 442–443. 1922.—A method of using superheated steam in the centrifugals to prevent sugar deterioration by fungi and bacteria is described.—*C. W. Edgerton.*

6633. Owen, Wm. Ludwell. **Mold fungi in sugar inversion.** Facts about sugar **16**: 519–521, 546–548. 1923.—Molds, as well as their extracts, have the power to invert sucrose and consequently cause a deterioration of sugar. Seventeen molds were tested and it was found that these differed widely in their inverting ability. Extracts were also made both from the mycelium and from the spores. An active invertase was obtained from the mycelium but not from the spores. More active extracts were obtained from young cultures than from old ones. In some instances, the fungus extracts were able to invert the sucrose at densities at which the fungus was inactive.—*C. W. Edgerton.*

6634. Owen, Wm. Ludwell. **Protective inoculation of raw sugar.** Sugar **25**: 65–68, 117–119, 177–179. 1923.—The inoculation of sugars with suitable types of filamentous yeasts (Torulae) prevents the development of fungi and consequently reduces the deterioration of the sugars. The Torulae ferment the invert sugar and give off CO_2, which prevents the development of the fungi.—*C. W. Edgerton.*

6635. Weimer, J. L., and L. L. Harter. **Influence of temperature on the pectinase production of different species of Rhizopus.** Amer. Jour. Bot. **10**: 127–132. 1923.—*Rhizopus nigricans, R. reflexus, R. Tritici, R. Artocarpi, R. Delemar, R. Maydis, R. nodosus, R. Oryzae, R. arrhizus, R. microsporus, and R. chinensis* were studied. All but the last 2 are parasitic on the sweet potato, producing a pectinase which dissolves the middle lamella, thus macerating the potato. The fungi were grown at 9, 20, 30, and 40°C., and the rate at which the enzyme which was exuded into the solution, as well as that which was retained in the mycelium, would macerate a disc of potato, was determined. The enzyme seems to be produced at any temperature at which the fungus grows. The amount produced was in all cases least at the highest temperature. That in the mycelium increased progressively as the temperature was lowered, and that exuded into the solution showed the same result except that the quantity was slightly reduced as the temperature fell from 20 to 9°C. The nonparasitic species produced a considerable quantity of enzyme, whereas *R. nigricans*, 1 of the parastic ones, produced a very small amount. In general, the middle lamellae of old potatoes were dissolved in about ½ the time required to macerate the tissue of new ones.—*E. W. Sinnott.*

6636. Weimer, J. L., and L. L. Harter. **Pectinase in the spores of Rhizopus.** Amer. Jour. Bot. **10**: 167–169. 1923.—The spores of 2 species, *Rhizopus nigricans* and *R. Tritici*,

were isolated and their macerating action on raw sweet potato discs tested. Spores of both species were found to contain pectinase capable of dissolving the middle lamella of the sweet potato. The rate of maceration produced by spores of the former species is much slower than that produced by the latter, when the concentration of the spores by weight is the same.—*E. W. Sinnott.*

ORGANISM AS A WHOLE

6637. Adams, J. **The effect on certain plants of altering the daily period of light.** Ann. Botany 37: 75–94. 1923.—Plants belonging to 11 common species were darkened in different cases for periods of 1, 2, 3½, and 5 hours daily during June and July in latitude 45½°, and compared with undarkened plants. In almost all cases those exposed longest to light showed greatest average height, greatest average weight, and earliest flowering period.—*W. P. Thompson.*

6638. Johnston, Earl S., William E. Barron, and G. A. Loveland. **Agricultural meteorology.** Bull. Amer. Meteorol. Soc. 1: 76–77. 1920.—Methods for determining relations between plant growth and climatic conditions are noted.—*Earl S. Johnston.*

6639. Rosa, J. T., Jr. **Note on an indirect effect of spraying potatoes with Bordeaux mixture.** Amer. Jour. Bot. 10: 113–116. *2 fig.* 1923.—Potato plants sprayed with Bordeaux remained green about 3 weeks longer, and yielded over ⅓ more, than unsprayed control plants, presumably because of the reduced injury through tip-burn and hopper-burn. The tubers from the sprayed plots, however, consisted to a large extent of knobby 2nd growths, so that the actual quantity of marketable potatoes was really much less than from the control plots where the tubers were mostly normal. The variety studied was Early Ohio. The author suggests that alternating wet and dry periods, with the resulting intermittent growth, may have been the cause of the 2nd growths, which would thus be more marked in the sprayed plants since their growing season was longer. If 2nd-growth tubers are due to this cause, they should not necessarily be discriminated against for seed purposes.—*E. W. Sinnott.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

6640. Snow, R. **The conduction of geotropic excitation in roots.** Ann. Botany 37: 43–54. *4 fig.* 1923.—When roots of *Vicia faba* are decapitated and placed horizontally they rarely curve down in response to gravity. But when the tips of the decapitated roots are stuck on again with gelatin, the roots in most cases respond in the ordinary way. Therefore, the excitation set up in the tip must be conducted back through the gelatin. When a cut is made half way through a root 2 mm. from the tip and a slip of mica is inserted the root responds strongly whether the cut be on the upper or lower side; the response is doubtful when the cut is lateral. If 2 slips are inserted from any 2 opposite sides no response takes place. Therefore the excitation cannot be conducted back by a sinuous path.—*W. P. Thompson.*

6641. Waight, F. M. O. **On the presentation time and latent time for reaction to gravity in fronds of Asplenium bulbiferum.** Ann. Botany 37: 55–62. 1923.—The leaves are negatively geotropic. Their irritability shows a well marked grand period as measured by the presentation time (the shortest period of stimulation required to cause any response on a clinostat). At a very early stage in development, when the apical coil is just above the soil, the presentation time is about 8 hours (at 20°C. and 85 per cent moisture). It decreases to a minimum of ½ hour when the leaf has 5–7 pairs of leaflets unfolded, and then rises to about 6 hours just before the leaf is mature, when irritability is lost. The latent time (period between the beginning of stimulation and the 1st indication of response) has a range of 16–5 hours and its curve is in general similar to that for presentation time, though not affected to so great an extent by the stage of development. Maximum geotropic irritability as judged by minimum presentation time is associated with maximum rate of growth.—*W. P. Thompson.*

TOXIC AGENTS

6642. Stovall, W. D., and M. Starr Nichols. **Chlorination of swimming pool water.** Amer. Jour. Public Health 13: 478–480. 1923.—"It seems that to maintain a pool in a potentially germicidal condition requires a chlorine residuum of either free or organic chlorine and that the amount will vary enormously with the water used and it seems that there will be found waters in which it will be found impossible to maintain a sufficient residuum owing to the irritating effect of the chlorine on the eyes." For the present chlorination is to be considered a valuable adjunct to other methods of disinfection and sanitation.—*C. A. Ludwig.*

SOIL SCIENCE

A. G. McCall, *Editor*

(See also in this issue Entries 6153, 6157, 6162, 6171, 6172, 6176, 6181, 6187, 6188, 6271, 6426, 6551, 6554, 6608, 6617, 6620)

6643. Bruce, A. **A contribution to the study of the paddy soils of Ceylon and eastern countries.** Dept. Agric. Ceylon Bull. 57. *54 p.* 1922.

6644. Bruce, A. **Forest soils of Ceylon.** Dept. Agric. Ceylon Bull. 61. *30 p.* 1923.

6645. Schneidewind. **Neue Düngungsversuche.** [New fertilizer experiments.] Mitteil Deutsch. Landw. Ges. 38: 139–141. 1923.—A report on comparative tests of various forms of nitrogen, phosphorus and potash on rye, oats, potatoes and sugar beets. Sodium nitrate was the most efficient form of nitrogen. On light sands poor in lime Thomas phosphate was better than superphosphate. Raw rock was useful only on highly acid soils such as high moors, while the value of the different forms of potash varied with the crop.—*A. J. Pieters.*

TAXONOMY OF VASCULAR PLANTS

J. M. Greenman, *Editor*

E. B. Payson, *Assistant Editor*

(See also in this issue Entries 6241, 6251, 6296, 6350, 6351, 6424, 6425, 6461)

GENERAL

6646. Anonymous. **The botanical survey of British Malaya.** [Rev. of: Ridley, H. N. **The flora of the Malay Peninsula.** Vol. 1. **Polypetalae.** *xxx + 918 p.* L. Reeve & Co.: London, 1922 (see Bot. Absts. 12, Entry 6124).] Nature 111: 6–7. 1923.—This review is mainly a brief summary of botanical surveys and publications dealing with the region.—*O. A. Stevens.*

6647. Almquist, E. **Linné und das natürliche Pflanzensystem.** [Linnaeus and the natural plant system.] Bot. Jahrb. Beiblatt 128: 1–16. 1922.—The author attempts to present a clearer view than is ordinarily held of Linnaeus' conception of a natural system of classification. In so doing he correlates Linnaeus' views with those of Goethe, with the selection theory, and with Mendelism. Linnaeus held that there was an orderly relation of organisms from the simplest to the highest, but he did not conceive of actual descent except in limited groups. Species of a genus he thought may have come from a single original species; genera of a family from a single original genus. The multiplicity of species he believed due to hybridization. Linnaeus founded his species on characters which were not variable. Cultural variation of an ecological nature he omitted in his floras as well as monstrosities and pathological forms. Mendelism is in line with Linnaeus' idea of the origin of species by crossing, and tends to substantiate his hypothesis. The species concept in bacteria is discussed, also Linnaeus' "collective species," in which he employs trinomial instead of binomial nomenclature.—*K. M. Wiegand.*

6648. Ascherson, Paul, und Paul Graebner. **Synopsis der mitteleuropäischen Flora.** [Synopsis of the flora of central Europe.] Lieferung 92. Vol. VII. *P. 401-480.* Wilhelm Engelmann: Leipzig, Feb. 27, 1917.—This part continues the treatment of the Euphorbiaceae and includes the indigenous genera *Chrozophora, Mercurialis,* and *Euphorbia* in part. Four exotic genera are represented in the flora of central Europe through the following plants which have become there established: *Mallotus japonicus* Muell. Arg., *Acalypha virginica* L., *A. mexicana* Muell. Arg., *Ricinus communis* L., and *Homalanthus populifolius* Graham.—*J. M. Greenman.*

6649. Burnham, Stewart H., and Roy A. Latham. **Flora of the Town of Southold, Long Island (third supplementary list, part 2).** Torreya 23: 25–31. 1923.—This final installment includes 10 species of Polyporaceae, 4 of Agaricaceae, 3 of Gasteromycetes, 2 of Hepaticae, 12 of Musci, 1 of Pteridophyta and 67 of Spermatophyta. The total number of species reported in all the lists is 2,461, of which 1,130 are flowering plants.—*J. C. Nelson.*

6650. Fyson, P. F. [Rev. of: Rangachariar, K., and C. Tadulingam. **A handbook of South Indian grasses.** Government Press: Madras, 1921.] Jour. Indian Bot. 3: 124–125. 1922.

6651. Gardner, G. A. **Nouvelles observations. Réponse au Rév. Père Fontanel, S. J.** [New observations. A reply to Rev. Father Fontanel, S. J.] Nat. Canadien 48: 267–270. 1922.—The habitat, color, size and general appearance of plants are the characters which permit the determination of a species, and the author maintains that the number of species of violets, for instance, are not exaggerated. Perfume may also be a determining character. Further illustrations are taken from the various forms of *Hepatica.*—*A. H. MacKay.*

6652. Jones, Chapin. **Common forest trees of Virginia. A pocket manual describing their most important characteristics.** Virginia Geol. Commission Bull. 26. *2nd. ed., 64 p.* 1923.—The author describes in non-technical terms 62 of the common trees of Virginia. The text is supplemented by figures showing the distinctive characters of each species.—*J. M. Greenman.*

6653. Macwatt, John. **The primulas of Europe.** *8 vo, 208 p., 49 illus. (8 col.)* Published at the offices of "Country Life," and by George Newnes: London; also Charles Scribner's Sons: New York, 1922.—The author of this volume has devoted years of study to the primroses and has embodied in this book some of the results obtained from a long experience in cultivating this selective group of plants. The systematic treatment is adapted largely from the work of Pax to whom due acknowledgement is made. A rather extended bibliography, readable descriptions, and excellent illustrations from photographs, some of which are colored, are outstanding features of the work.—*J. M. Greenman.*

6654. Nelson, James C. [Rev. of: Chase, Agnes. **A first book of grasses.** *121 p., 94 fig.* The Macmillan Co.: New York, 1922.] Torreya 23: 33–34. 1923.—The spikelet is taken as the basis of classification, and its modifications are studied in the order of their increasing complexity, beginning with the Festuceae. The book is sound in its pedagogy, and strictly scientific in method.—*J. C. Nelson.*

6655. Ridley, Henry N. **The flora of the Malay Peninsula. Vol. II. Gamopetalae.** *8 vo, 672 p., 76-131 fig.* L. Reeve & Co.: London, 1923.—This volume follows closely the plan of the previous one [see Bot. Absts. 12, Entry 6124] and includes the families Caprifoliaceae to Labiatae, likewise arranged essentially in the sequence of Bentham and Hooker's Genera Plantarum. The following new species, varieties, and combinations are included: *Argostemma involucratum* Hemsl. var. *glabrum* and var. *hirsutum* (*A. hirtum* Ridl.), *Ophiorrhiza major* (*O. erubescens* King, not Wall.), *O. rosacea* (*O. rosea* Ridl., not Hook. f.), *O. pallidula, O. scabrella, O. fruticosa* (*O. fruticulosa* Ridl., not Nadeaud.), *Hedyotis globiceps, Mussaenda*

spectabilis, *M. malaccensis*, *M. angustisepala* (*M. Teysmanniana* King, not Miq.), *M. cordifolia* Wall. var. *pubescens*, *Mycetia Scortechinii* (*Adenosacme Scortechinii* King & Gamble), *M. lanceolata* (*A. lanceolata* Ridl.), *M. flava* (*A. flava* Ridl.), *Urophyllum glabrum* Wall. var. *Blumeanum*, *U. sessiliflorum*, *Randia stenopetala* (*Gardenia stenopetala* King), *Petunga floribunda* (*P. Roxburghii* var. *floribunda* King), *Ixora humilis* King & Gamble var. *Scortechinii* (*I. Scortechinii* King & Gamble), *Pavetta pauciflora*, *P. naucleiflora* Wall. var. *longifolia*, *Tarenna Napieri* (*Webera Napieri* Ridl.), *T. papillosa* (*Stylocoryna adpressa* var. *papillosa* King), *T. Evansii*, *T. rudis*, *T. salicina* (*Webera salicina* Ridl.), *T. pulchra* (*W. pulchra* Ridl.), *T. longifolia* (*W. longifolia* Hook. f.), *T. grandifolia* (*W. grandifolia* Hook. f.), *T. odorata* (*W. odorata* Roxb.), *T. Yappii* (*W. Yappii* King), *T. Wrayi* (*W. Wrayi* King), *T. Wallichii* (*W. Wallichii* Hook. f.), *T. Ridleyi* Pearson (*W. Ridleyi* Pearson), *T. stellulata* (*W. stellulata* Hook. f.), *T. Curtisii* (*W. Curtisii* King), *T. adangensis* (*W. adangensis* Ridl.), *T. calcarea*, *Timonius peduncularis* (*Guettarda peduncularis* Wall.), *Prismatomeris malayana* (*P. albiflora* King, not Thw.), *Morinda Scortechinii* (*M. umbellata* var. *Scortechinii* King & Gamble), *M. Ridleyi* (*M. umbellata* var. *Ridleyi* King & Gamble), *Psychotria pachyphylla* (*P. sarmentosa* var. *pachyphylla* King & Gamble), *P. sarmentosa* Bl. var. *montana*, *P. lanceolaria*, *P. Griffithii* Hook. f. var. *angustifolia*, *P. atroviridis*, *Cephaelis melanocarpa*, *Streblosa microcarpa* (*Psychotria microcarpa* Wall.), *Lasianthus stipularis* Bl. var. *hirtus*, *L. pilosus* Wight var. *setosus* (*L. setosus* Wight), *L. Maingayi* Hook. f. vars. *hirta* and *subglabra*, *L. Harveyanus* King & Gamble var. *longifolia*, *Borreria laevicaulis* (*Bigelovia laevicaulis* Miq.), *B. pilulifera*, *B. parviceps*, *B. setidens* (*Bigelovia setidens* Miq.), *Vernonia javanica* DC. var. *mollissima*, *Gynura malasica* (*G. zeylanica* var. *malasica* Ridl.), *Agapetes perakensis* (*A. Griffithii* King, not Clarke), *A. Wrayi*, *Rhododendron orion* Ridl. var. *aurantiacum*, *Pernettyopsis breviflora* (*Diplycosia breviflora* Ridl.), *Maesa lancifolia*, *M. oocarpa* (*M. ovocarpa* Ridl.), *Embelia rugosa* (*E. ribes* var. *rugosa* King & Gamble), *E. subcordata*, *Labisia pothoina* Lindl. vars. *alata* and *lanceolata*, *Ardisia andamanica* Kurz var. *latifolia*, *A. Vaughani*, *Sideroxylon littorale*, *Bassia hirtiflora*, *B. caudata*, *B. Watsoni*, *B. laurifolia* King & Gamble vars. *typica*, *obtusa* and *parvifolia*, *B. Motleyana* Clarke var. *Scortechinii*, *Maba buxifolia* Pers. var. *rhomboidea*, *Diospyros tubicalyx*, *D. pubicarpa*, *D. cymosa*, *D. latisepala* (*D. paniculata* King, not Dalziel), *Symplocos adenophylla* Wall. var. *montana*, *Cordyloblaste confusa* (*Symplocos confusa* Brand), *C. pulcherrima* (*S. pulcherrima* Ridl.), *C. obovata* (*S. obovata* Ridl.), *C. crenulata* (*S. crenulata* Ridl.), *C. Maingayi* (*S. Maingayi* Clarke), *C. Scortechinii* (*S. Scortechinii* King & Gamble), *Linociera caudifolia* (*L. caudata* King & Gamble, not Bedd.), *Olea penangiana* (*O. dentata* King, not Wall.), *Willughbeia flavescens* Dyer var. *rufescens* (*W. rufescens* Dyer), *Kopsia singapurensis* (*K. fruticosa* var. *albiflora* King & Gamble), *Ervatamia pauciflora* and var. *minor*, *Alstonia latifolia* (*A. angustifolia* var. *latifolia* King & Gamble), *Dregea stellaris* (*Marsdenia stellaris* Ridl.), *Hoya rufo-lanata*, *Physostelma Wrayi* (*Hoya Wrayi* King & Gamble), *Norrisia malaccensis* Gardn. var. *major* (*N. major* Solereder), *Fagraea pauciflora* (*F. racemosa* var. *pauciflora* King & Gamble), *Cryptophyllum giganteum* (*Fagraea gigantea* Ridl.), *Gaertnera acuminata* Benth. vars. *oxyphylla* (*G. oxyphylla* Benth.) and *montana*, *Datura fastuosa* L. vars. *typica* and *alba*, *Utricularia vitellina* (*U. aurea* Ridl., not Lour.), *U. albina* (*U. albiflora* Griff., not Br.), *Aeschynanthus breviflora* (*A. parviflora* Ridl., not Spreng.), *Didissandra petiolata*, *Didymocarpus sulphurea* Ridl. vars. *breviflora* and *grandiflora*, *D. urticaefolia*, *D. hispida* Ridl. var. *selangorensis*, *D. malayana* Hook. f. var. *fasciata*, *D. reptans* Jack var. *modesta* (*D. modesta* Ridl.), *D. Curtisii* (*D. crinita* var. *Curtisii* Ridl.), *Chirita parvula*, *C. sericea* Ridl. var. *Scortechinii*, *Paraboea cordata* Ridl. var. *ophirensis*, *P. tiumanica* Burkill, *P. salicina* (*Didymocarpus salicina* Ridl.), *P. grandifolia* (*D. grandifolia* Ridl.), *P. capitata* Ridl. var. *oblongifolia*, *Codonoboea leucocodon* (*Paraboea leucocodon* Ridl.), *C. ericaeflora* (*Didymocarpus ericaeflora* Ridl.), *C. lilacina* (*D. lilacina* Ridl.), *Boea lancifolia*, *B. minutiflora*, *Cyrtandra cupulata* Ridl. var. *minor*, *Pandorea Curtisii* (*Tecoma Curtisii* Ridl.), *Staurogyne longifolia* Kuntze var. *condensata*, *Hygrophila phlomoides* Nees var. *angusta*, *Nomaphila stricta* Nees var. *minor* (*N. minor* Clarke) and var. *corymbosa* (*N. corymbosa* Bl.), *Strobilanthes phoeniceus* (*S. violacea* Ridl., not Bedd.), *Lepidagathis Yappii*, *Pseuderanthemum hirtipistillum* (*Eranthemum hirtipistillum* Clarke), *P. breviflos* (*E. breviflos* Clarke), *P. candidum* (*E. candidum* Ridl.), *P. caudifolium* (*E. caudifolium* Clarke), *P. selangorense* (*E. selangorense* Clarke), *P. sylvestre*, *P. Kingii* (*E. Kingii*

Clarke), *P. graciliflorum* (*E. graciliflorum* Nees), *P. Teysmanni* (*E. Teijsmanni* Clarke), *Calophanoides quadrifaria* (*Justicia quadrifaria* Wall.), *Justicia vegeta* Ridl. var. *terminalis*, *J. Clarkeana* (*Rungia laxiflora* Clarke), *J. ovalis*, *Ptyssiglottis parviflora* (*Pseuderanthemum parviflorum* Ridl.), *P. densiflora* (*Leda densiflora* Clarke), *P. flava* (*L. flava* Ridl.), *P. chrysea*, *P. rubro-lutea*, *Polytrema aequale* and var. *minor*, *Peristrophe acuminata* Nees var. *salicifolia* (*P. salicifolia* Miq.), *Callicarpa furfuracea*, *Premna rubens* (*P. flavescens* var. *rubens* Clarke), *P. integrifolia* L. var. *minor*, *P. angustior* (*P. integrifolia* var. *angustior* Clarke), *Clerodendron deflexum* Wall. var. *bracteatum*, *Vitex trifolia* L. var. *repens*, *Avicennia lanata*, and *A. sphaerocarpa* Stapf.—*J. M. Greenman.*

6656. Sabnis, T. S. **The flora of Sind.** Jour. Indian Bot. 3: 151–153, 178–180. 1923. (To be continued.)—The author is extending his investigations on the physiological anatomy of the plants of the Indian Desert. Part I will include a list of plants with their localities and distribution, and Part II will deal with the physiological anatomy and ecology of the flora. The plant list so far, based on Bentham and Hooker's system, includes 10 families, 21 genera, and 32 species. *Cleome brachycarpa* Vahl var. *longepetiolata* is described as a new variety. [See also Bot. Absts. 5, Entry 1904; 6, Entry 771; 11, Entry 4222.]—*Winfield Dudgeon.*

6657. Sarasin, Fritz, und Jean Roux. **Nova Caledonia. Forschungen in Neu-Caledonien und auf den Loyalty-Iseln. Botanik.** [**New Caledonia. Researches in New Caledonia and on the Loyalty Islands. Botany.**] *4 to.* Vol. I–L. ii. *P. 89–176, pl. 5–6.* C. W. Kreidel's Verlag: Berlin and Wiesbaden, 1920.—The present part [see also Bot. Absts. 12, Entry 896] of this extensive work was edited by Hans Schinz and A. Guillaumin. The groups of plants included and some of the specialists who have cooperated are: Fungi of New Caledonia and the Loyalty Islands by E. M. Wakefield; Lichenes (Supplement) by A. D. Cotton; Hepaticae (Supplement) by Franz Stephani; Algae by R. Mirande; Lycopodiales (Supplement) by Hans Schinz; Siphonogamae (Coniferae to Elaeocarpaceae) by Hans Schinz and A. Guillaumin. The following new species and new variety of fungi are described: *Amanita pumila* Mass., *Marasmius sulcatus* Mass., *Favolus Sarasini* Wakefield, *Stereum umbro-alutaceum* Wakefield, *Clavaria Sarasini* Cotton, *Lachnocladium neglectum* Mass., *Dacryomitra tenuis* Wakefield, *Le Ratia coccinea* Mass. & Wakefield, *Xylaria hirtella* Wakefield, *Nectria nigro-ostiolata* Wakefield, and *Sarcoscypha coccinea* Jacq. var. *minor* Wakefield. New species and combinations among the flowering plants are: *Mariscus pennatus* Schinz & Guillaumin (*Cyperus pennatus* Lam.), *M. Deplanchei* Schinz & Guillaumin (*Baumea Deplanchei* Boeckl.), *Basselinia eriostachys* Beccari (*Cyphokentia eriostachys* Brongn.), *Campecarpus fulcita* Beccari (*Kentia fulcita* Brongn.), *Piper austro-caledonicum* C. DC. var. *crassispicum* C. DC., *P. staminodiferum* C. DC., *Peperomia kanalensis* C. DC., *P. lifuana* C. DC., *P. Sarasinii* C. DC., *Pachygone loyaltiensis* Diels, *Nasturtium sarmentosum* Schinz & Guillaumin (*Cardamine sarmentosa* Forster), *Acacia simplicifolia* Schinz & Guillaumin (*Mimosa simplicifolia* L. f.), *Arthroclianthus ischnopodus* Guillaumin, *Cajanus pseudocajan* Schinz & Guillaumin (*Cytisus pseudo-cajan* Jacq.), *Zanthoxylum Sarasinii* Guillaumin, *Geijera Balansae* Schinz & Guillaumin, (*Zanthoxylum Balansae* Baill.), *Evodia ignambiensis* Guillaumin, and *Cleidion Vieillardi* Baill. var. *mareense* Guillaumin.—*J. M. Greenman.*

6658. Sargent, Charles Sprague. **Manual of the trees of North America (exclusive of Mexico).** *2nd ed., 8 vo, xxvi + 910 p., 783 fig., 1 map.* Houghton Mifflin Company: Boston & New York, 1922 (Price $12.50).—The 1st edition of this manual was published in 1905. Since that time knowledge of the trees of North America has been greatly advanced, largely through the activities of the author of this work; and the present edition embodies much of the additional information acquired. Eighty-nine species, many varieties, and 141 illustrations have been added in the new edition. Comparatively few of the species recognized in the former edition have been reduced to the rank of varieties or to synonymy. It is noteworthy that in this work there have been relatively few changes in plant names. The more important generic names which have been changed are the following: *Tumion* Raf. gives way to *Torreya* Arn.; *Serenoa* Hook. f. to *Acoelorraphe* H. Wendl.; *Hicoria* Raf. to *Carya* Nutt.; *Pasania* Oerst.

to *Lithocarpus* Bl.; *Toxylon* Raf. to *Maclura* Nutt.; *Pisonia* L. to *Torrubia* Vell.; *Zygia* P. Br. to *Pithecolobium* Mart.; *Fagara* L. to *Xanthoxylum* L.; *Fremontodendron* Cov. to *Fremontia* Torr.; *Chytraculia* P. Br. to *Calyptranthes* Sw.; *Xolisma* Raf. to *Lyonia* Nutt.; *Icacorea* Aubl. to *Ardisia* Sw.; *Crescentia* L. to *Enallagma* Bail. While these alterations have necessarily required a change in the binomial they have not resulted in new combinations. Some of the species recognized in the former edition, which fall to synonymy are: *Yucca arborescens* Trel. = *Y. brevifolia* Engelm.; *Yucca radiosa* Trel. = *Y. elata* Engelm.; *Salix Nuttallii* Sarg. = *S. Scouleriana* Barr.; *Quercus californica* Coop. = *Q. Kelloggii* Newb.; *Quercus nana* Sarg. = *Q. ilicifolia* Wang.; *Persea pubescens* Sarg. = *P. palustris* Sarg.; *Sassafras Sassafras* Karst. = *S. officinale* Nees & Ebermaier; *Cercis texensis* Sarg. = *C. reniformis* Engelm.; *Metopium Metopium* Small = *M. toxiferum* Kr. & Urb.; *Rhus hirta* Sudw. = *R. typhina* L.; *Gyminda Grisebachii* Sarg. = *G. latifolia* Urb.; *Tilia americana* L. = *T. glabra* Vent. The groups having the largest number of additional species are the hawthorns and lindens. The present edition recognizes 153 species of *Crataegus* instead of 132; and *Tilia* now includes 15 instead of 6 species.—*J. M. Greenman.*

PTERIDOPHYTES

6659. D'Almeida, J. D. **The Indian Ophioglossums.** Jour. Indian Bot. 3: 58–65. *1 pl. 13 fig.* 1922.—Six species are recognized. *O. vulgatum* L. var. *Aitchisoni* C. B. Clarke is given specific rank, as *O. Aitchisoni.*—*Winfield Dudgeon.*

6660. Forbes, Charles N. **Notes on Marsilea villosa Kaulf.** Occasional Papers Bernice P. Bishop Mus. 7: 47–49. *Pl. 13–14.* 1920.—Comments are made on former collections of this plant and on the occurrence of a station for it in Palolo Valley, Honolulu. It is concluded "that *M. villosa* Kaulf. and *M. vestita* Hook. & Grev. are the same species."—*H. F. Bergman.*

6661. F[yson], P. F. [Rev. of: Blatter, E., and J. F. d'Almeida. **The ferns of Bombay.** *22 p., 17 pl. (2 col.), 45 fig.* D. B. Taraporevala Sons & Co.: Bombay, (1922) (see Bot. Absts. 12, Entry 4636).] Jour. Indian Bot. 3: 157–158. 1923. [See also Bot. Absts. 12, Entry 4637.]

6662. Maxon, Wm. R. **Ferns new to the Cuban flora.** Jour. Washington [D. C.] Acad. Sci. 12: 437–443. 1922.—From material collected in the higher mountainous regions of Cuba, the writer has described 4 new species and cited 22 other species new to Cuba. A number of these have previously been known only from Jamaica. The new species are: *Cyathea producta* of the Cyatheaceae, *Dicranopteris Leonis* of the Gleicheniaceae; *Polypodium calvum* and *Psilogramme cubensis* of the Polypodiaceae.—*Helen M. Gilkey.*

6663. Maxon, Wm. R. **The genus Microstaphyla.** Jour. Washington [D. C.] Acad. Sci. 13: 28–31. 1923.—The rank of this genus, founded by Presl but since much disputed, is discussed, and the writer accepts it as a valid genus. A new species, *M. columbiana*, is described, and the principal synonymy of the 2 previously known species, cited.—*Helen M. Gilkey.*

6664. Mousley, Henry. **Further notes on the ferns of Hatley, Stanstead County, Quebec, 1921-22.** Canadian Field Nat. 36: 149–152. 1922.—The addition of 6 ferns now brings the total number for this region to 47 species and varieties.—*W. H. Emig.*

6665. Mousley, Henry. **The alpine maidenhair fern (Adiantum pedatum L. var. aleuticum Rupr.) at Hatley, Stanstead County, Quebec.** Canadian Field Nat. 37: 84–85. 1923.—This fern is rare in the eastern part of Canada and the U. S. A.—*W. H. Emig.*

SPERMATOPHYTES

6666. Bailey, L. H. **The cultivated Brassicas.** Gentes Herbarum 1: 53–108. *Fig. 18–49.* 1922.—After interesting introductory remarks discussing problems of the taxonomy of cultivated plants in general, principles of generic and specific segregation, and the history of the genus *Brassica* with which *Sinapis* is united, the author gives a key to the 19 species recognized,

followed by the enumeration of the species and varieties with citation of synonyms and with full descriptions and illustrated by 31 figures. The following new species and new varieties are proposed: *Brassica alboglabra, B. Napobrassica* Mill. var. *solidifolia, B. Rapa* L. var. *lorifolia, B. nipposinica* and var. *laciniifolia, B. juncea* Coss. var. *crispifolia*, var. *japonica* (Thunb.), var. *multisecta, B. narinosa, B. parachinensis, B. dubiosa.—Alfred Rehder.*

6667. Beauverd, G. **A propos du Primula farinosa forma flexicaulis. [Remarks on Primula farinosa forma flexicaulis.]** Bull. Soc. Bot. Genève **13**: 16. 1921.

6668. Beauverd, G. **Contributions à la flore de l'Amerique du Sud. [Contributions to the flora of South America.]** Bull. Bot. Soc. Genève **13**: 7–8, 267–270. 1921.—Two new species and several varieties of plants from Uruguay are described. These are: *Nothoscordon Felipponei* Beauverd, *Alternanthera Felipponei* Beauverd, *Mollugo verticillata* L. subsp. *subsessilis* Beauverd & Felippone, *Oxalis Sellowiana* Zucc. var. *caulescens* Beauverd & Felippone, *O. articulata* Savi var. *nodulosa* Beauverd & Felippone, *Polygala linoides* Poiret var. *ambigua* Felippone & Beauverd, *Echium plantagineum* L. var. *monodasystemon* Beauverd & Felippone, and *Richardsonia brasiliensis* Gomez var. *dubia* Beauverd & Felippone.—*W. H. Emig.*

6669. Beauverd, G. **Nouvelles Mutisiées des Andes de Bolivie. [New Mutisieae (Compositae) from the Bolivian Andes.]** Bull. Soc. Bot. Genève **13**: 10–11. 1921.—Several new plants here named will be described in a later issue of the Bulletin.—*W. H. Emig.*

6670. Beauverd, G. **Une race nouvelle du Primula hirsuta All. en Valais. [A new variety of Primula hirsuta All. in Valais.]** Bull. Soc. Bot. Genève **13**: 11. 1921.—The plant is characterized as *Primula hirsuta* All. var. *serrulata* Bvrd. n. var.—*W. H. Emig.*

6671. Blake, S. F. **Two new species of letterwood (Piratinera).** Jour. Washington [D.C.] Acad. Sci. **12**: 391–399. *Fig. 1.* 1922.—The heartwood of several species of *Piratinera* belonging to the family Moraceae and native to the Guianas, has long formed a timber of commerce, used principally in the manufacture of walking sticks, umbrella handles, and violin bows. From new material received from British and Dutch Guiana, the author has described 2 new species, *Piratinera scabridula* and *P. velutina*, and has reduced *P. discolor* Pittier to *P. guianensis* Aubl. Full descriptions of the new species, citations of the 4 previously known, and a key to all the species of the genus, are included.—*Helen M. Gilkey.*

6672. Britton, Nathaniel Lord. **Studies of West Indian plants—XI.** Bull. Torrey Bot. Club **50**: 35–56. 1923.—From Cuba are described the following new species: *Juniperus saxicola* Britton & Wilson, *Myrica cacuminis* Britton & Wilson, *Pilea ovalifolia* Britton & Wilson, *P. membranacea* Britton & Wilson, *P. micromeriaefolia* Britton & Wilson, *P. yarensis* Britton & Wilson, *P. ermitensis* Britton, *P. crenata* Britton & Wilson, *Coccolobis monticola* Britton, *C. saxicola* Britton, *Talauma* (?) *orbiculata* Britton & Wilson, *Persea anomala* Britton & Wilson, *P. similis* Britton & Wilson, *Nectandra reticularis* Britton & Wilson, *Rubus turquinensis* Rydberg, *Polygala scabridula* Blake, *P. rhynchosperma* Blake, *P. ambigens* Blake, *Maytenus saxicola* Britton & Wilson, *Rhamnidium bicolor* Britton & Wilson, *Ouratea xolismaefolia* Britton & Wilson, *Taonabo monticola* Britton & Wilson, *T. Leonis* Britton & Wilson, *Haemocharis angustifolia* Britton & Wilson, *Begonia lomensis* Britton & Wilson, *Ginoria montana* Britton & Wilson, *Psidium* (?) *cacuminis* Britton & Wilson, *Calyptranthes montana* Britton & Wilson, *Eugenia cati* Britton & Wilson, *E. ginoriaefolia* Britton & Wilson, *E. lomensis* Britton & Wilson, *E. brevipetiolata* Britton & Wilson, *E. rigidula* Britton & Wilson, *Anamomis reticulata* Britton & Wilson, *Graffenrieda rufescens* Britton & Wilson, *Miconia plumieriaefolia* Britton & Wilson, *Rapanea microphylla* Britton & Wilson, *Symplocos Leonis* Britton & Wilson, *Plumiera montana* Britton & Wilson, *Marsdenia bicolor* Britton & Wilson, *Sebesten Leonis* Britton & Wilson, *Varronia longipedunculata* Britton & Wilson, *Salvia scopulorum* Britton & Wilson, *Rondeletia naguensis* Britton & Wilson, *R. calophylla* Standley, *Guettarda cryptantha* Standley, *G. cobrensis* Standley, *Stenostomum apiculatum* Britton & Standley, *Psychotria*

Leonis Britton & Wilson, *Lobelia cacuminis* Britton & Wilson, *Senecio Leonis* Britton & Wilson, and *Chaptalia montana* Britton. From Trinidad are described: *Bactris savannarum* Britton, *Pilea aripoensis* Britton, *Inga ierensis* Britton, *Serjania ierensis* Britton, *Clusia intertexta* Britton, *C. aripoensis* Britton, *Stylogyne tenuifolia* Britton, *Prestonia Fendleri* N. E. Brown, *Cordia ierensis* Britton, *Aegiphila trinitensis* Britton, *Anguria elliptica* Britton; from Porto Rico: *Scleria doradoensis* Britton, *S. Stevensiana* Britton, *Lagenocarpus portoricensis* Britton, *Rynchospora Blauneri* Britton, and *R. luquillensis* Britton; and from Hayti, *Siphocampylus pinnatisectus* Gleason.—*P. A. Munz.*

6673. Farwell, Oliver A. **Notes on the Michigan Flora III.** Rept Michigan Acad. Sci. 22: 177–185. 1920.—Reports on additions to the known vascular flora of Michigan are recorded. The following new forms or combinations are given: *Setaria italica* (L.) Beauv. f. *praecox* (Alef.) n. comb. (*Panicum italicum* var. *praecox* Alef., *S. italica* var. *germanica* Hitchc.), *Setaria italica* var. *germanica* f. *Metzgeri* (Korn.) n. comb. (*Panicum italicum* var. *Metzgeri* Korn.), *Setaria italica* f. *macrochaeta* (Korn.), n. comb. (*P. italicum* var. *macrochaetum* Korn.), *Sporobolus cryptandrus* (Torr.) Gray var. *involutus* n. var., *Panicularia nervata* (Willd.) Kuntze var. *viridis* n. var., *Carex cristata* Schwein. f. *ellipsoidalis* n. f., *C. sterilis* Willd. f. *flexibilis* n. f., *C. cephalophora* Muhl. var. *bracteosa* n. var., *C. Grayii* Carey var. *rariflora* n. var., *Polygonatum canaliculatum* Pursh var. *oblongifolium* n. var., *Allionia aggregata* (Ortega) Spreng. var. *hirsuta* (Pursh) n. comb. (*Allionia hirsuta* Pursh.), *Lespedeza frutescens* (L.) Britton var. *acutifructa* n. var., *Viola sagittata* Ait. var. *subsagittata* (Greene) n. comb. (*Viola subsagittata* Greene), *Scrophularia marilandica* L. var. *viridis* n. var., *Plantago lanceolata* L. f. *composita* n. f., *Helianthus divaricatus* L. var. *ternatus* n. var., *Senecio obovatus* Muhl. var. *minor*. n. var., *Artium minus* f. *pallidum* n. f. A remarkable addition to the flora of Michigan is the crucifer *Hymenophysa pubescens* C. A. Meyer, discovered well established at Ypsilanti by B. A. Walpole. This is native to the Altai region of central Asia.—*Ernst A. Bessey.*

6674. Farwell, Oliver Atkins. **Notes on the Michigan flora IV.** Papers Michigan Acad. Sci. 1: 85–100. 1923.—Notes are given on species new to the known flora of Michigan, together with some new species, varieties, or combinations. These are as follows: *Panicum Bicknellii* Nash var. *Bushii* (Nash) n. comb. (*P. Bushii* Nash), *Echinochloa Crusgalli* (L.) Beauv. f. *sabulicola* (a correction for the typographical error f. *sabulonum* Farwell), *Chaetochloa verticillata* (L.) Scribn. var. *breviseta* (Godr.) n. comb. (*P. verticillatum* var. *brevisetum* Godr.), *C. viridis* (L.) Scribn. var. *major* (Gaud.) n. comb. (*P. viride* var. *majus* Gaud.), *C. viridis* (L.) Scribn. var. *minor* (Koch.) n. comb. (*Setaria viridis* var. *minor* Koch), *C. viridis* (L.) Scribn. var. *breviseta* (Doell) n. comb. (P. *viride* var. *brevisetum* Doell), *C. italica* (L.) Scribn. f. *praecox* (Alef.) n. comb. (*P. italicum* var. *praecox* Alef.), *C. italica* (L.) Scribn. var. *germanica* (Roth) n. comb. (*P. germanicum* Roth), *C. italica* var. *germanica* (Roth) Farwell f. *Metzgeri* (Koern.) n. comb. (*P. italicum* var. *Metzgeri* Koern.), *C. italica* var. *germanica* (Roth) Farwell f. *macrochaeta* (Koern.) n. comb. (*P. italicum* var. *macrochaetum* Koern.), *Agrostis perennans* var. *humilis* n. var., *Graphephorum Cooleyi* (A. Gr.) n. comb. (*Dupontia Cooleyi* A. Gr.), *Lepturus incurva* (L.) n. comb. (*Aegilops incurva* L., *Lepturus incurvatus* Trin.), *Carex cephalophora* Muhl. var. *anomala* n. var., *C. vulpinoidea* Mx. var. *annectens* (Bicknell) n. comb. (*C. annectens* Bicknell), *C. sparaganioides* Muhl. var. *lutea* n. var., *Juncus Torreyi* Coville f. *longipes* n. f., also f. *brevipes* n. f. and var. *paniculata* n. var., *Habenaria hyperborea* (L.) R. Br. var. *media* (Rydb.) n. comb. (*Limnorchis media* Rydb.), also var. *huronensis* (Nutt.) n. comb. (*Orchis huronensis* Nutt.), *Polygonum amphibium*, var. *marginatum* Farwell f. *hirtuosum* n. f., *Amaranthus Torreyi* (Gray) Benth. f. *prostratus* n. f., *Anemone quinquefolia* L. var. *bifolia* n. var., *Bursa Bursa-pastoris* (L.) Britton var. *minor* (DC.) n. comb. (*Capsella Bursa-pastoris* var. *minor* DC.), *Meibomia nudiflora* (L.) O.K. f. *foliolata* n. f., *Rhus copallina* L. f. *crispa* n. f., *Oenothera muricata* L. var. *rubricaulis* n. var., *Uraspermum aristatum* (Thunb.) var. *villicaule* (Fernald) n. comb., *Gentiana Billingtonii* n. sp., *Teucrium occidentalis* A. Gr. var. *menthifolium* (Bickn.) n. comb. (*T. menthifolium* Bicknell), *T. canadense* var. *virginicum* (L.) n. comb. (*T. virginicum* L.), *Dracocephalum*

virginianum L. var. *speciosum* (Sweet) n. comb. (*Physostegia virginiana* var. *speciosa* A. Gr.), *D. denticulatum* Ait. var. *obovatum* (Ell.) n. comb., *Aureolaria heterophylla* (Nutt.) n. comb. (*Gerardia heterophylla* Nutt.), *A. Skinneriana* (Wood) Farwell var. *asperula* (A. Gr.) n. comb. (*Gerardia tenuifolia* var. *asperula* A. Gr.), *A. tenuifolia* (Vahl.) Farwell var. *Gattingeri* (Small) n. comb. (*Gerardia Gattingeri* Small), *A. Skinneriana* f. *pallida* n. f., *Plantago Rugelii* Dcne. var. *asperula* n. var., *P. Rugelii* var. *alterniflora* n. var., *Solidago bicolor* var. *concolor* T. & G. f. *ramosior* n. f., *S. neglecta* T. & G. var. *simulata* n. var., *Sericocarpus asteroides* (L.) B.S.P. f. *albopapposus* n. f., *Aster dumosus* f. *monocephalus* n. f.—*Ernst A. Bessey.*

6675. Forbes, Charles N. **New Hawaiian plants. VII.** Occasional Papers Bernice P. Bishop Mus. **7**: 33-39. *Pl. 3-11.* 1920.—*Hibiscadelphus bombycinus, Viola kauiaiensis* Gray var. *wahiawaensis, Cyrtandra olona, C. hii, C. propinqua, C. Munroi, C. Georgiana, Clermontia Samuelii, Argyroxiphium caligini,* and *A. caligini* var. *Kai* are described as new to science.—*H. F. Bergman.*

6676. Forbes, Charles N., and George C. Munro. **A new Cyanea from Lanai, Hawaii.** Occasional Papers Bernice P. Bishop Mus. **7**: 43. *Pl. 12.* 1920.—*Cyanea Baldwinii* sp. nov. is described.—*H. F. Bergman.*

6677. Hitchcock, A. S. **The grasses of Hawaii.** Mem. Bernice P. Bishop Mus. **8**: 101-230. *Pl. 31-35, fig. 1-110.* 1922.—An introduction containing an account of the material examined is followed by a general discussion of the grasses characteristic of various habitats and a list of introduced species. Keys are given to the tribes, genera and species. Each species is described with synonymy and citation of Hawaiian specimens; figures are also given for a large number of them. At the end is a catalogue of specimens cited and a list of new species and new names. The following are described as new species: *Cenchrus Hillebrandianus, Eragrostis deflexa, E. leptophylla, E. mauiensis, Festuca hawaiiensis, Panicum Fauriei, P. Forbesii, P. kaalaense, P. kauaiense.* The following new combinations and new names are also included: *Poa sandvicensis* (*Festuca sandvicensis* Reichart), *Aira nubigena* (*Deschampsia nubigena* Hillebr.), *Calamagrostis Hillebrandi* (*Deyeuxia Hillebrandi* Munro), *C. expansa* (*Deyeuxia expansa* Munro), *Syntherisma chinensis* (*Paspalum chinensis* Nees), *S. microbachne* (*Panicum microbachne* Presl), *Panicum xerophilum* (*P. nephelophilum* γ var. *xerophilum* Hillebr.), *P. lanaiense* (*P. affine* Hook. & Arn., not Poir.), *P. Hillebrandianum* (*P. monticola* Hillebr., not Hook. f.), *Sacciolepis contracta* (*Panicum contractum* Wight & Arn.), *Ischaemum byrone* (*Spodiopogon byronis* Trin.).—*H. F. Bergman.*

6678. Lauterbach, C. **Die Guttiferen Papuasiens. [The Guttiferae of Papuasia.]** Bot. Jahrb. **58**: 1-49. *10 fig.* 1922.—Under the general heading "Beiträge zur Flora von Papuasian, series IX, no. 80" the author treats the Guttiferae of this region, enumerating 66 species in 9 genera and giving keys as well as extensive bibliographical and distributional notes. Of the 9 genera 4 are endemic and of the 66 species, 61 are endemic. The larges genus is *Garcinia* with 42 species, 40 of which are endemic. Notes on exceptional or interesting species and genera are given. The following new species, forms, combinations, and names are proposed: *Hypericum Hellwigii* (*H. japonicum* Warbg. *H. Macgregorii* Lautb.), *Ochrocarpus papuanus, Calophyllum papuanum, C. Peekelii, C. Versteegii* (*C. Burmanni* Lautb.), *C. trachycaule, C. sil, C. euryphyllum, Garcinia Hollrungii, G. squamata, G. Edelfeldtii* (*G. novo-guineensis* Vesque), *G. Moszkowsii, G. enthaematoeides, G. tauensis, G. umbonata, G. Versteegi* (*G. aff. picrorhiza* Miq.), *G. sumbawensis, G. erythrosperma, G. nubigena, G. Klinkii, G. ramulosa, G. pallida, G. pachypetala, G. torensis, G. fruticosa, G. hygrophila, G. Ledermannii, G. assugu, G. oreophila, G. pallide-sanguinea, G. sabangensis, G. rupestris, G. tuberculata, G. maluensis, G. fusco-petiolata, G. Gjellerupii, G. Jaweri, G. Hunsteinii, G. Pullei, G. Schraderi, G. Schlechteri, Tripetalum cymosum* K. Schum. f. *pendula, Pentaphalangium latissimum* (*?Garcinia latissima* Miq.), *Cyclandra Ledermannii, C. papuana.* The genus **Cyclandra** is proposed as new.—*K. M. Wiegand.*

6679. Merrill, E. D. **New or noteworthy Bornean plants; part III.** Jour. Malayan Branch Roy. Asiatic Soc. **1**: 22–45. 1923.—The following new species are described: *Vaccinium Moultonii, Ardisia sublepidota, A. diversilimba, Rapanea multibracteata. Diospyros Jupii, Epigynum borneense, Willughbeia* (*Urnularia*) *borneensis, Petraeovitex membranacea, Callicarpa involucrata, Didymocarpus multinervia, Cyrtandra didissandriformis, C. longicarpa, C. simplex, Neonauclea longipedunculata, Hedyotis fissistipula, H. platyphylla, Urophyllum borneense, U. suberosum, Psychotria Woodii, P. grandistipula, Xanthophytum longipedunculatum, Melothria diversifolia* and *Momordica acuminata.* New combinations are: *Willughbeia ovatifolia* (*Urnularia ovatifolia* Stapf), *Pseudernathemum album* (*Justicia alba* Roxb., *Eranthemum album* Nees). New name: *Willughbeia Stapfii* (*Urnularia oblongifolia* Stapf, not *Willughbeia oblongifolia* O. Ktz.). Twelve other species are mentioned, with localities.—*R. E. Holttum.*

6680. Parker, R. N. **A new species of Astragalus from Kumaon.** Indian Forest. **49**: 78-79. *Pl. 5.* 1923.—A full description of a new species, *Astragalus aegacanthoides*, is given. —*E. N. Munns.*

6681. Parker, R. N. **A new species of Leptodermis.** Indian Forest. **48**: 576–577. 1922. —A description is given of the new species *L. kumaonensis*, which is similar to both *L. lanceolata* Wall. and *L. Parkeri* Dunn.—*E. N. Munns.*

6682. Petch, T. **A new Bulbophyllum.** Jour. Indian Bot. **3**: 148–150. *12 fig.* 1923.—*B. tricarinatum* is described as new, from the Maturata district, Ceylon.—*Winfield Dudgeon.*

6683. Ridley, H. N. **A botanical excursion to northern Sumatra.** Jour. Malayan Branch Roy. Asiatic Soc. **1**: 46–113. 1923.—The mountain flora of the neighborhood of Berastagi is described, with an enumeration of about 490 species of vascular plants, including descriptions of 92 new species. A number of palaearctic genera common to the mountains of northern India and Java are found at Berastagi; a few of these are to be found also at 1 point in the Malay Peninsula (Telom, on the borders of Perak and Pahang) and it is considered probable that these Peninsula plants were derived from Sumatra and indicate a former land-connection between Sumatra and the Peninsula, and a former wider extension of the open type of vegetation in which they occur. Only 1 species of *Didymocarpus* is found at Berastagi, and palms are remarkably few as compared with similar situations on the Malay Peninsula. New species are: *Clematis sumatrana, Melodorum breviflorum, Saurauja roseata, Sterculia sumatrensis, Glycosmis sumatrana, Celastrus axillaris, Rhamnus sumatrensis, Rubus battakensis, Eugenia sulphurata, Melastoma vulcanicum, Oxyspora racemosa, Medinilla vulcanica, M. micrantha, Pachycentria scandens, Begonia Beccariana, B. flexula, Aralia Beccarii, Lonicera pulcherrima, Ophiorrhiza deflexa, O. exserta, O. subcrenata, Carlemannia sumatrana, Argostemma stellatum, A. corymbosum, A. triflorum, Mussaenda hirsuta, Mycetia angustifolia, Urophyllum grandifolium, U. macranthum, Petunga hirta, Stylocoryne sylvicola, Psychotria penduliflora, P. multinervia, Chasalia propinqua, Cephaelis pauciflora, Lasianthus* (*Mephitidia*) *vulcanicus, Blumea scabrifolia, Gynura aspera, Clethra pulcherrima, Ardisia* (*Pimelandra*) *megalocarpa, Labisia ovalifolia, Payena vulcanica, Hoya rhodostele, Dischidia polyphylla, Aeschynanthus fruticosus, Didymocarpus vulcanica, Rhynchotechum angustifolium, Cyrtandra pauciflora, C. pandurata, Strobilanthes hirticalyx, S. multiflora, S. anceps, Justicia virescens, Eranthemum sumatrense, Hypoestes tenuifolia, Callicarpa eriophylla, Clerodendron microcalyx, Pogostemon battakianum, Gomphostemma sumatrense, Thottea hirsuta, Piper* (*Cubeba*) *philodendron, P.* (*Eupiper*) *melanocarpum, P.* (*Eupiper*) *salticola, P. coactile, Beilschmiedia sumatrensis, Trema lancifolia, Ficus inaequilatera, Oberonia elongata, Microstylis sumatrensis, Liparis pratensis, Ceratostylis scariosa, Dendrochilum lepidum, D. brevilabre, Calanthe unifolia, Goodyera casta, Hetaeria grandiflora, Globba candida, Hedychium cylindricum, Amomum sumatrense, Hornstedtia Beccarii, Phaeomeria caudiculata, Musa sumatrana, Forrestia sumatrensis, F. porrecta, Pinanga parvula, Calamus karuensis, Homalomena Burkilliana, H.* (*Chamaecladon*) *obovata, Pothos paucinervis, Pandanus Burkillianus, Capillipedium scabridum, Erianthus decus-sylvae*, and *Cyclophorus grandis.*—*R. E. Holttum.*

6684. Schlechter, R. **Neue Orchidaceen Papuasiens. [New orchids of Papuasia.]** Bot. Jahrb. **58**: 50–96. 1922.—Under the general heading "Beiträge zur Flora von Papuasien, series IX, no. 81" the author describes many new orchids of this region. This supplements a previous paper on the orchids of German New Guinea by the same author in 1914. Over 2,650 species are now known in Papuasia, which, in proportion to its area, makes this region the richest in orchids of any in the world even including the Cordillera States of South America. The number of large genera is remarkable: *Dendrobium* and *Bulbophyllum* contain more than 500 species and *Phreatia* more than 115. Several other genera are nearing the 100 mark, while at least 13 contain more than 20 species. The following species and varieties are proposed as new: *Corysanthes Ledermannii, Cryptostylis lancilabris, C. philippinensis, Lecanorchis bicarinata, Erythrodes sepikana, Zeuxine leucotaenia* and var. *floribunda, Z. curvata, Microstylis dolichostachys, M. fulva, M. Ledermannii, M. petiolaris, M. Stolleana, M. vinosa, Oberonia elegans, O. Ledermannii, Liparis anceps, L. scleriifolia, Mediocalcar ericiflorum, M. sepikanum, Epiblastus Schultzei, Ceratostylis Bulbophylli, C. sphaerocephala, C. gracilicaulis, C. pinguis, C. tetrarioides, C. brachyphylla, C. heleocharis, C. tenuis, C. juncoides, Agrostophyllum sepikanum, A. congestum, A. cycloglossum, Glomera asperata, G. graminifolia, G. macrophylla, G. patens, G. Schultzei, Glossorhyncha Hunsteiniana, G. Ledermannii, G. pteropetala, G. Schultzei, Giulianettia verrucosissima, G. fusca, G. inflata, Aglossorhyncha stenophylla, Podochilus anguinus, P. falcipetalus, P. lancilabris, Appendicula sepikana, Cadetia cuneilabia, C. lactiflora, C. latoureoides, C. platyloba, C. quadriquetra, C. sepikana, Dendrobium lonchigerum.—K. M. Wiegand.*

6685. Standley, Paul C. **Diospyros Conzattii, a new species of persimmon from Mexico.** Jour. Washington [D. C.] Acad. Sci. **12**: 399–400. 1922.

6686. Sterrett, W. D. **A new oak from the Gulf States.** Jour. Elisha Mitchell Sci. Soc. **37**: 178–179. 1922.—The species described as *Quercus Ashei* is near the post oak, from which it differs mainly in narrower crown, more slender twigs, and much smaller fruit. It occurs in willow oak flats from Wood County, Texas, to Winn Parish, Louisiana.—*W. C. Coker.*

REVISIONS AND MONOGRAPHS

6687. Anonymous. [Rev. of: Pfeiffer, Norma E. **Monograph of the Isoetaceae.** Ann. Missouri Bot. Gard. **9**: 79–232. *19 pl.* 1922.] Nature **111**: 443. 1923.

6688. Beccari, Odoardo. **Asiatic palms—Lepidocaryeae. Part III. The species of the genera: Ceratolobus, Calospatha, Plectocomia, Plectocomiopsis, Myrialepis, Zalacca. Pigafetta, Korthalsia, Metroxylon, Eugeissona.** Ann. Roy. Bot. Gard. Calcutta **12**[2]: 1–231. *Pl. 1–6.* 1918. Ibid. *Pl. 1–118.* 1921.—Descriptions and illustrations of the following new species and combinations are included: *Ceratolobus rostratus* (*Korthalsia rostrata* Bl.), *Plectocomia billitonensis, P. Elmerii, P. bractealis, P. Kerrana, Plectocomiopsis dubius, Zalacca sumatrana, Z. Scortechinii, Korthalsia furcata, K. paucijuga, K. Merrillii, K. celebica, K. Rogersii, K. Hallieriana, K. macrocarpa, Metroxylon squarrosum, M. Warburgii* (*Coelococcus Warburgii* Heim), *M. upoluense, M. amicarum* (*Sagus amicarum* Wendl.), and *Eugeissona ambigua* (*E. tristis* Becc., not Griff.). Several new varieties are characterized. This volume also contains a conspectus of the genera of *Lepidocaryeae* and keys to the extra-Asiatic species of *Raphia, Ancistrophyllum, Oncocalamus, Eremospatha, Lepidocaryum,* and *Mauritia. Mauritia peruviana* is described as a new species from Peru. [See also Bot. Absts. 12, Entry 6692.] —*J. M. Greenman.*

6689. Beccari, Odoardo, and Joseph F. Rock. **A monographic study of the genus Pritchardia.** Mem. Bernice P. Bishop Mus. **8**: 1–77. *Pl. 1–24, fig. 1.* 1921.—The monograph is divided into 2 parts. Part I deals with the distribution and characteristics of the genus *Pritchardia.* According to the authors "74 per cent of all the genus are endemic in the Hawaiian group." The fertilization and structural peculiarities of *Pritchardia* are discussed. This is followed by a discussion of the distribution of species by islands in the Hawaiian

group and the uses which the Hawaiians make of these palms. Part II is a systematic treatment. A conspectus of the species is presented followed by a detailed description of the species, of which there are 33 with several varieties. The following new species and varieties are described: *Pritchardia affinis* Becc. with vars. *holaphila*, *rhopalocarpa*, and *gracilis* Becc., *P. lanaiensis* Becc. & Rock, *P. glabrata* Becc. & Rock, *P. kaalae* Rock, *P. Forbesiana* Rock, *P. Lowreyana* Rock, *P. Lowreyana* var. *turbinata* Rock, *P. brevicalyx* Becc. & Rock, *P. Beccariana* Rock var. *Giffardiana* Becc., *P. Hardyi* Rock, *P. Munroii* Rock, *P. montis-kea* Rock, *P. viscosa* Rock, *P. kahanae* Rock & Caum, and *P. martioides* Rock & Caum.—*H. F. Bergman.*

6690. Brown, N. E. **The Cactus family.** [Rev. of: Britton, N. L., and J. N. Rose. **The Cactaceae: descriptions and illustrations of plants of the Cactus family.** Vol. 3. Carnegie Inst. Washington Publ. 248. Vol. 3. *i–vii, 1–255. 24 pl.* 1922.] Nature **111**: 426–427. 1923.—This volume probably will appeal to a larger number of Cactus fanciers than the preceding ones as it deals chiefly with the smaller kinds which are more generally cultivated. It is unfortunate that such a name as "*Echinofossulocactus*" should come into use; the formation of such names might well be prohibited.—*O. A. Stevens.*

6691. Fyson, P. F. **The Indian species of Eriocaulon (continued).** Jour. Indian Bot. **3**: 12–18, 91–115. *Pl. 42–51.* 1922.—Section VII, *Connato-sepalae*, with 1 species, and Section VIII, *Leucantherae*, with 5 species (*E. horsley-kundae* new) are described. Fifty-one species in all are recognized. Appendix I gives a list of 12 species which the author has not seen and has been unable to identify, and a list of species reduced from, restored to, changed, and new to Hooker's Flora of British India and Ruhland's Monograph. Appendix II gives a list of all the sheets of Indian species of *Eriocaulon* in the principal herbaria of India, and an index to the Indian species. [See also Bot. Absts. 11, Entry 4823.]—*Winfield Dudgeon.*

6692. [H., A. W.] **Climbing palms and the sago palms.** [Rev. of: Beccari, Odoardo. **Asiatic palms—Lepiodocaryeae. Part III. The species of the genera: Ceratolobus, Calospatha, Plectocomia, Plectocomiopsis, Myrialepis, Zalacca, Pigafetta, Korthalsia, Metroxylon, Eugeissona.** Ann. Roy. Bot. Gard. Calcutta **12**^{2}: *1–231. Pl. 1–6*, 1918. Ibid. *Pl. 1–118*, 1921 (see Bot. Absts. 12, Entry 6688).]. Nature **110**: 372–373. 1922.

6693. Maiden, J. H. **A critical revision of the genus Eucalyptus.** Vol. VI. Part 8. *P. 419–494, pl. 236–239.* John Spence: Sydney, February, 1923.—The present part contains descriptions and illustrations of 4 previously published species and 6 species and 1 variety new to science, as follows: *Eucalyptus collina* Fitzgerald n. sp., *E. Flocktoniae* Maiden, *E. Shirleyi*, *E. Rummeryi*, *E. Herbertiana*, *E. comitae-vallis*, *E. longifolia* Link & Otto var. *multiflora*, *E. citriodora* Hooker, *E. hemiphloia* F.v.M., *E. microcarpa*, and *E. albens* Miquel. A chapter is included on the inflorescence.—*J. M. Greenman.*

6694. Tubeuf, Karl, von. **Monographie der Mistel.** *Roy. 8 vo, xii + 832 p., 35 pl., 179 fig., 6 maps.* R. Oldenbourg: Munich and Berlin, 1923.—The author presents an exhaustive monograph of the true mistletoe, *Viscum album* L. The work is divided in 3 parts. The 1st part deals with the prehistoric occurrence of the mistletoe in Europe; the role of the mistletoe in the life of the people; the German, botanical, and common names of the mistletoe; the present geographical distribution. The 2nd part treats the morphology, anatomy, physiology, biology, and pathology of the mistletoe. The 3rd part takes up the role of the mistletoe in park, fruit, and forest trees. Of particular interest to the taxonomist is that portion of the work which concerns the detailed treatment of the geographical distribution.—*J. M. Greenman.*

6695. Watson, E. E. **The genus Heliocarpus.** Bull. Torrey Bot. Club **50**: 109–128. 1923.—A treatment is given of the genus *Heliocarpus* in which 22 species, and a possible 23rd, are recognized and for which diagnoses and distribution are given. *H. viridis*, *H. australis*, and *H. rudis* are described as new species.—*P. A. Munz.*

6696. Yuncker, T. G. **Revision of the South American species of Cuscuta. II.** Amer. Jour. Bot. 10: 1–17. *Pl. 1–5.* 1923.—Of 14 species belonging to the subsection *Platycarpae* of the section *Clistogrammica*, *C. pentagona* var. *subulata* and *C. insquamata* are described as new. —*E. W. Sinnott.*

FLORISTICS AND PLANT DISTRIBUTION

6697. Anonymous. **Flore du Labrador. [Flora of Labrador.]** Nat. Canadien 49: 183–186. 1923.—A list is given of over 130 species of Labrador plants, collected or observed in 1895 by Abbé P. Lemay.—*A. H. MacKay.*

6698. Ashe, W. W. **Azalea in North Carolina.** Jour. Elisha Mitchell Sci. Soc. 38: 90–91. 1922.—A key is given to the 13 species recognized from the eastern U. S. A., 8 of them occurring in North Carolina; in addition, 10 varieties are noted. There is appended a note on the distribution of *Rhododendron* in which the variety *Margarettae* of *R. carolinianum* is raised to specific rank.—*W. C. Coker.*

6699. Ashe, W. W. **The eastern shrubby species of Robinia.** Jour. Elisha Mitchell Sci. Soc. 37: 175–177. 1922.—A key is given of the 9 eastern shrubby species of the genus, including *R. margaretta* and *R. grandiflora*, which are described as new. *Robinia Hardwegii* Koeh. is reduced to a variety of *R. viscosa.—W. C. Coker.*

6700. Beauverd, G. **Nouvelles acquisitions pour la florule phanérogamique Genevoise. [New acquisitions to the phanerogamic flora of Geneva.]** Bull. Soc. Bot. Genève 13: 38–39. 1921.—The author describes *Stachys annua* L. var. *glareosa* as a new variety, and also characterizes 3 new subvarieties of *Prenanthes purpurea* L. var. *genuina* Bvrd.—*J. M. Greenman.*

6701. Beauverd, G. **Résumé des herborisations aux marais de Sionnet-Rouelbeau (Genève), la plage des "Crenees" et les bois de Tanney-Mies (Vaud). [Résumé of a collection of plants from the swamps of Sionnet-Rouelbeau (Geneva) in the vicinity of "Crenees" and the forests of Tanney-Mies (Vaud).]** Bull. Soc. Bot. Genève 12: 131–136. 1920.—The author lists noteworthy plants collected in certain bogs and forests of Switzerland.—*W. H. Emig.*

6702. Beauverd, G. **Sur la flore vasculaire des environs de Modane, de Bardonnèche et de Suze (Massif du Cenis). [The vascular flora in the vicinity of Modana, Bardonnecchia, and Susa (Mont Cenis).]** Bull. Soc. Bot. Genève 13: 115–184. 1921.—This article consists of a summary of a number of field trips including descriptions of the following new varieties and subspecies: *Pulsatilla alpina* Schrank var. *Cottianaea* Bvrd., *Ranunculus geraniifolius Pourret* subsp. *Cottianaeus* Bvrd., *Capsella Bursa-pastoris* (L.) Medic. var. *pulchella* Bvrd. & Guyot, *Linum alpinum* L. var. *praecox* Bvrd., and *Viola silvestris* Lam. var. *Cottianaea* Bvrd. The mountain and alpine plants make up 38.5 per cent of the total number of species found, xerophytic plants, 35 per cent, mesophytic plants, 14.5 per cent, and hygrophytic species, 12 per cent.—*W. H. Emig.*

6703. Bertsch, K. **Neue Gefässpflanzen unserer Flora. [New vascular plants of our flora.]** Jahresh. Ver. Vaterländ. Naturk. Württemberg 76: 62–75. *3 fig.* 1920.—As a result of recent explorations the author records the following species and hybrids as additions to the flora of Württemberg: *Equisetum trachyodon* A. Br., *Typha minima* Fck., *Potamogeton filiformis* Pers., *P. panormitanus* Bivona, *Calamagrostis arundinacea* × *epigeios*, *Festuca capillata* Lam., *Carex polygama* Schkuhr, *C. Hornschuchiana* × *lepidocarpa*, *C. Hornschuchiana* × *Oederi*, *Hemerocallis flava* L., *Gladiolus communis* L., *Thalictrum exaltatum* Gaud., *Aconitum Stoerkianum* Reichenb., *Corydalis ochroleuca* Koch., and *Aster lanceolatus* Willd. Each is accompanied by descriptive notes and by data on distribution. The figures represent the floral parts of the hybrid *Calamagrostis* and of the 2 parental species.—*A. W. Evans.*

6704. Bessey, E. A. **Nymphaea microphylla in Michigan.** Papers Michigan Acad. Sci. 1: 59–60. 1923.—*Nymphaea microphylla* Pers. was found in 1920 in Gogebic County, the westernmost county of the Upper Peninsula of Michigan. This may throw light on the possible hybrid nature of *N. rubrodisca*, which is now shown to coincide in its range with *N. microphylla*.—*Ernst A. Bessey.*

6705. Chodat, R. **La végétation du Paraguay. XI. Borraginacées.** [The vegetation of Paraguay. XI. Borraginaceae.] Bull. Soc. Bot. Genève 12: 157–171. *Fig. 304–312.* 1920.—The family Borraginaceae is represented by many species of *Heliotropium*, and *Tournefortia*. *H. curassavicum* L. occurs in waste places of coarse sand, and *H. inundatum* Sw. is found on the banks of lagoons. Ruderal species include *H. europaeum* and *H. indicum* L.; and in the woods and underbrush many forms of *H. monostachyum* DC. and *H. monostachyum* var. *tiaridioides* Cham. are represented. *Tournefortia laevigata* Lam. is common in similar situations. The genus *Cordia* is represented by a large number of trees. The structure of the flowers and leaves of certain species of *Cordia* is illustrated. [See also Bot. Absts. 11, Entry 3212.]—*W. H. Emig.*

6706. Danzig, E. **Beiträge zur Kenntnis der Phanerogamenflora des sächsischen Vogtlandes.** [Contributions to the knowledge of the phanerogamic flora of the Saxon Vogtland.] Sitzungsber. u. Abhandl. Naturw. Ges. "Isis" 1920–21: 1–10. 1922.—The author records the more important results of his explorations during 1919–21 in the Vogtland, a district in the southern part of Saxony. He enumerates 96 species and hybrids of greater or less rarity, designating 24 as new to the region and 1, the hybrid *Anthemis arvensis* × *tinctoria*, as new to Saxony. Each species is accompanied by data regarding stations, and many descriptive or critical notes are included.—*A. W. Evans.*

6707. Darlington, H. T. **Contributions to the flora of Gogebic County, Michigan. Part I.** Rept. Michigan Acad. Sci. 22: 147–176. 1921.—Gogebic County is the westernmost county of the Upper Peninsula of Michigan. Part is hilly and well drained, part is low and swampy; lakes are very abundant. Much of the area is covered with virgin hardwood timber. The plants collected in August, 1919, number 38 ferns and fern allies, 10 conifers, 143 monocotyledons, including 52 grasses and 35 sedges, and 316 dicotyledons, including 58 composites (in the wider sense of the term). Of the 316 dicotyledons, 65 were woody in whole or at least in part.—*Ernst A. Bessey.*

6708. Darlington, H. T. **Contributions to the flora of Gogebic County, Michigan. Part II.** Papers Michigan Acad. Sci. 1: 74–82. 1923.—Collections made in the early part of the summer of 1920 added the following to the vascular flora of this county: 2 ferns (total 40); 43 monocotyledons (total 186) including 9 grasses (total 61) and 21 sedges (total 56); and 59 dicotyledons (total 375) including 5 composites (total 63). The 9 additional woody plants bring the total of woody plants up to 74 out of the total of 601 vascular plants.—*Ernst A. Bessey.*

6709. Diels, L. **Eine Scaevola von Mikronesien.** [A Scaevola from Micronesia.] Bot. Jahrb. 56: 561. 1921.—This is no. 20 of the series: Beiträge zur Flora von Mikronesien und Polynesien II, edited by L. Diels. *Scaevola frutescens* (Mill.) Krause is reported from the Caroline and Marshall Islands.—*K. M. Wiegand.*

6710. Guyot, Henry. **L'ancienne extension des forêts dans la region du Grand St-Bernard (Valais).** [The ancient extension of the forests in the region of Grand St. Bernard (Valais).] Bull. Soc. Bot Genève 12: 152–153. 1920.—*Pinus Cembra* L. occurred in the region of St. Bernard previous to the 17th century.—*W. H. Emig.*

6711. Lendner, A., et G. Beauverd. **L'Erica vagans L. du territoire Genevois.** [Erica vagans L. of the Geneva region.] Bull Soc. Bot. Genève 13: 30. 1921.

6712. McAtee, W. L. **Notes on interesting plants in Michigan.** Papers Michigan Acad. Sci. 1: 155–166. 1923.—Here are published notes on various plants representing forms little known or that are additions to the known flora of Michigan, based on an annotated copy of Beal and Wheeler's Michigan Flora which was the property of the late Professor C. F. Wheeler, and upon letters and specimens enclosed in that copy.—*Ernst A. Bessey.*

6713. Praeger, R. Lloyd. **Notes on Antrim plants.** Irish Nat. 29: 95–105. 1920.—These notes concern chiefly the local distribution of plants in County Antrim, Ireland.—*W. E. Praeger.*

6714. Praeger, R. Lloyd. **Notes on Down and Dublin plants.** Irish Nat. 30: 101–103. 1921.—Sundry observations on habits and distribution are recorded.—*W. E. Praeger.*

6715. Rebholz, E. **Beiträge zur Wildrosenflora des oberen Donautales und seiner Umgebung I.** [**Contributions to the wild rose flora of the upper valley of the Danube and vicinity. I.**] Jahresh. Ver. Vaterländ. Naturk. Württemberg 78: 20–34. 1922.—The district studied is in the southern part of Württemberg and includes Tuttlingen and the surrounding country. The author describes the general appearance of the rose flora among the other elements of the vegetation and discusses in detail the local distribution of the individual species. In this, the 1st part of his work, he takes up the sections *Synstylae*, *Gallicae*, and *Caninae*. The 1st is represented by 1 species, *Rosa arvensis* Huds. (with 4 varieties); the 2nd, also by 1 species, *R. gallica* L.; while the 3rd is represented by 12 species (distributed among 5 subsections as follows: *R. Jundzillii* Besser (with 2 subspecies), *R. rubrifolia* Villars (with 3 varieties, the var. *Rebholzii* R. Keller being described as new), *R. pomifera* Herrmann (with 1 variety), *R. tomentosa* Sm. (with 4 varieties), *R. rubiginosa* L. (with 3 varieties), *R. micrantha* (with 1 variety), *R. agrestis* Savi (with 1 variety), *R. tomentella* Leman, *R. canina* L. (with 5 varieties) *R. dumetorum* Thuiller (with 4 varieties), *R. glauca* Villars (with 6 varieties), and *R. coriifolia* Fr. (with 4 varieties, the var. *atra* R. Keller & E. Rebholz being described as new). Critical and descriptive remarks are given in connection with many of the species and varieties.—*A. W. Evans.*

6716. Romieux, Henri. **Remarques sur deux plantes du Maroc.** [**Remarks on two Moroccan plants.**] Bull. Soc. Bot. Genève 13: 30. 1921.—At an elevation of 1400 m., near Geneva, were found 2 plants of special interest: *Asphodelus acaulis* Desf., and *Boucerosia* sp.—*W. H. Emig.*

6717. Schlenker, K. **Über 2 Adventivpflanzen in der württ. Flora.** [**On 2 adventive plants in the flora of Württemberg.**] Jahresh. Ver. Vaterländ. Naturk. Württemberg 78: xxvii-xxix. 1922.—A report of a meeting is given in which the discovery of *Senecio vernalis* and *Bidens radiatus* in Württemberg was announced. The 1st is a native of Central Asia and Russia, the 2nd of southeastern Siberia. Both species are widely introduced into other parts of western Europe.—*A. W. Evans.*

6718. Smith, E. Phillip, and John B. Simpson. **Spiranthes autumnalis.** Nature 111: 291. 1923.—Two separate notes are recorded on the occurrence of this orchid at Carrbridge and on the Island of Coll, Argyllshire.—*O. A. Stevens.*

6719. Soth, Blanche H. **Flora of Pocatello, Idaho.** Amer. Bot. 29: 48–53. 1923.—The seasonal aspect of the flora of this region is discussed.—*S. P. Nichols.*

6720. Stelfox, A. W. **Note on Carex muricata L. and its segregates C. contigua Hoppe and C. Pairaei Schultz.** Irish Nat. 30: 31–32. 1921.

6721. Thompson, Bertha E. **Distribution of the Violaceae of Michigan.** Papers Michigan Acad. Sci. 1: 167–184. *Pl. 35–36.* 1923.—A list, based on specimens examined, is

given of the Violaceae occurring in Michigan, together with a key for their determination. One species of *Cubelium* and 34 of *Viola* are recognized in the state.—*Ernst A. Bessey.*

6722. Totten, H. R. **Wild ferns and flowers of Chapel Hill.** Jour. Elisha Mitchell Sci. Soc. **38**: 12. 1922.—*Tradescantia virginiana* L. and *Silene alba* Muhl. are added to the list of Chapel Hill (North Carolina) species.—*W. C. Coker.*

6723. Turrill, W. B. **Convolvulus nitidus Boiss., from the Balkan Peninsula.** New Phytol. **22**: 95–96. 1923.—The species named, known hitherto only from the mountains of southern Spain, is here reported from a similar locality (Mt. Ali-Botusch) in the Balkans.—*I. F. Lewis.*

6724. Voigt, Alban. **Beiträge zur Floristik des Tessins. II.** [**Contributions to the flora of Tessin. II.**] Sitzungsber. u. Abhandl. Naturw. Ges. "Isis" **1920–21**: 11–19. 1922.—The author reports the results of his 1921 explorations in the southern part of the canton of Tessin, Switzerland. He describes the physiographic and geological features of the district and comments on the large number of adventive plants in the flora, many of these having been introduced with Italian hay in 1919. The rare and otherwise interesting vascular plants collected are enumerated and number 91 species, varieties, and forms, 46 of which are new to the canton. Each species is accompanied by data regarding localities, and a few descripive or distributional notes are given. A new variety, *Stachys Ocymastrum* var. *purpureiflorus* Thell., and a new form, *Sisymbrium Loeselii* f. *pallidiflorum* Voigt, are described. *A. W. Evans.*

6725. Wiinstedt, K. **Farve-Vaid (Isatis tinctoria L.) vildtvoksende i Danmark.** [**Isatis tinctoria naturally growing in Denmark.**] Nat. Verden **6**: 33–36. 1922.—*Isatis tinctoria* L. var. *maritima* Rupr. was found in 1919 and 1920 on the island of Bornholm in the Baltic, where it was discovered in 1861, although absent in the meantime. It appears to have come from the Swedish coast where it grows spontaneously. The seed float on salt water 4–6 days. The plant was never much cultivated in Denmark, the localities are very few, and the occurence may always be connected with import of foreign grass seed.—*Ernst Gram.*

6726. Yuncker, T. G. **The genus Cuscuta in Michigan.** Papers Michigan Acad. Sci. **1**: 185–189. 1923.—A list is given with key of the 8 species of *Cuscuta* occurring in Michigan, based upon specimens examined by the author.—*Ernst A. Bessey.*

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

B. E. Livingston, *Editor*

S. F. Trelease, *Assistant Editor*

6727. Amann, J. **L'étude der mousses au microscope polarisant.** [**The study of mosses by means of a polarizing microscope.**] Rev. Bryologique **50**: 6–9. 1923.—The author presents some of the results obtained by the use of a polarizing microscope in the study of the leaves, peristomes, and other parts of mosses. He distinguishes between positive and negative effects, and brings out the fact that the optical properties of the cell-membranes depend upon chemical composition.—*A. W. Evans.*

6728. Bade, E. **Between two worlds.** Sci. Amer. **128**: 34. *4 fig.* 1923.—This article points out the various difficulties encountered in attempting to differentiate lower plants and lower animals, when employing the criteria of function and behavior.—*Chas. H. Otis.*

6729. Bailey, Vernon. **Sources of water supply for desert animals.** Sci. Monthly **17**: 66–86. 1923.—Some rabbits eat the prickley pear, *Opuntia Engelmanni*, and parts of even more spiny cacti. Talinum is also used. Rats, gophers, ground squirrels, and grasshopper

mice may use very little or no water, except that obtained from plants. Even man may live with a small amount, if he knows the plants to use and becomes accustomed to the conditions. —*L. Pace.*

6730. Ewart, Alfred J. **Biology during the war and after.** Rept. Australasian Assoc. Adv. Sci. 15: 134–144. 1921.—This is the President's address before Section D of Australasian Association for the Advancement of Science. It contains a short address on the value of botany as a science, followed by reports of recent Australasian researches in botany and zoology and by a short review of the work done at the National Herbarium of Victoria during the past 15 years.—*Ray C. Friesner.*

6731. Ferris, G. F. **The place of the systematist in modern biology.** Sci. Monthly 16: 514–520. 1923.—The work of the systematist is not only for his own field; all other biologists depend on it. It should have the best minds, and not be left for amateurs.—*L. Pace.*

6732. Greer, W. C. **Black gold of the Tropics.** Pharm. Era 56: 215–218. *2 fig.* 1923.—A description is given of the processes through which rubber passes in the manufacture of various articles.—*C. M. Sterling.*

6733. Köhler, A. **Das Mikroskop und seine Anwendung.** [**The microscope and its uses.**] Abt. II. **Physikalische Methoden.** Heft 2. Lieferung 95 of the **Handbuch der biologischen Arbeitsmethoden.** [Vol. II. **Physical methods.** Heft 2. Part 95 of the **Handbook of biological laboratory methods.**] *P. 171–352. Fig. 138–248.* Urban and Schwarzenberg: Berlin and Vienna, 1923. Edited by Emil Abderhalden.—The subject is treated under the following heads: geometrical relation between object and image; application of the law of images to lenses of definite thickness, or to a system of such lenses; remarks on photometry; photometrical relation between object and image; loss of light in optical systems; remarks concerning seeing with the unaided eye. Pages 237–286 are devoted to the hand lens, with the following sections: the formation of a level field through the magnifier; the imaging of a body through the magnifier; the imaging of an illuminated transparent or reflecting preparation; image defects of the magnifier and their improvement; different forms of magnifiers. Pages 286–352 deal with the simple microscope, with sections as follows: the imaging of a plane object by the simple microscope; the imaging of illuminated transparent objects; image defects of simple microscopes and their improvement; a few forms of the simple microscope; mountings and stands of the simple microscope; testing the magnifier and the simple microscope and measuring the magnification.—*C. S. Gager.*

6734. Mangham, Sidney. **Laboratory Notes. A simple respiroscope. A cheap bench light.** New Phytol. 21: 230–231. 1922.

6735. Mawson, Douglas. **Australasian Antartic expedition. Report on progress of publication of scientific results.** Rept. Australasian Assoc. Adv. Sci. 15: 286–291. 1921.

6736. Norman, J. R. **Methods and technique of reconstruction.** Jour. Roy. Microsc. Soc. London 1923: 37–56. *8 fig.* 1923.—A method of reconstructing objects in wax from serial sections is described.—*R. E. Cleland.*

6737. Slosson, Edwin E. **Current comment.** Sci. Monthly 16: 557. 1923.—Power in large quantities may be obtained from the fruit of prickly pears.—*L. Pace.*

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